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Dear Customer!

Thank you for choosing our product. You have purchased a double circuit wall-hung boiler with a closed combustion chamber.

Before purchasing the boiler please check:

- scope of delivery (see section 23, p. 42) and the boiler's resalable condition;
- compatibility of the type of gas (natural or liquefied) used by you with the type of gas indicated in sections 20 and 21 (p.40) of the following manual and with the table on the boiler's housing.

You should also require from the selling organization to fill in the warranty repair coupons.

When purchasing the boiler against a credit, the payment schedule must be drawn up with indication of the full due and payable amount. The payment schedule must be signed by the Customer with the date indicated and with print full name.

The boiler and the following manual are two integral parts of the offered goods. The manual contains information about the order of installation of the boiler, rules of its exploitation and technical service, following them will provide long-term failure-free and safe operation of the boiler. Please acquaint yourself carefully with this manual before putting the boiler into operation, follow the instructions in it and keep it safely for further use.

Best regards,
Armavirskiy Plant of Gas Equipment Ltd.

Telephone number of the unified technical support Service 8 800 555 40 35

(free call on the territory of Russian Federation, working hours of the service: Mon-Fri 09:00-17:00 Moscow)

Boiler installation is allowed only in non-living premises with the temperature not less +5° C in strict adherence to the Gasification project, SP 62.13330.2011 "Gas distribution systems. Updated edition of SNiP 42-01-2002", SP 41-108-2004 "Door-to-door heating of domestic buildings with gas-fueled heat generators" and SNiP 41-01-2003 "Heating, ventilation and conditioning".

All installation and mounting works, the instruction of the owner, preventive servicing, failure correction and repair are effectuated only by a specialized service organization.

The boiler is not unappropriated for use for people (including children) with low intellectual abilities or in default of life experience.

The responsibility for safe exploitation of the boiler and its maintenance in appropriate condition is on its owner. Non-compliance with the safety measures and installation rules, rules of use and technical service, stated in this manual, can cause boiler's breakdown, fire, burn, gas poisoning or poisoning with carbonic oxide (CO) and electrical shock.

Armavirskiy Plant of Gas Equipment Ltd. Is constantly working on improvement of output products and reserves the right for insertion of necessary changes in the boiler's construction. The following changes might not be displayed in the user's manual.

28.08.2012

1. SAFETY MEASURES

For the purpose of your own safety and in order to avoid the boiler's breakdown it is strictly prohibited to:

- Use the boiler when it is out of order;
- Put the boiler into operation with no flue pipe installed or with a defective flue pipe;
- All gas dangerous works, all technical service works and reparations of the boiler must be effectuated only by a specialized service organization;
- To effectuate boiler treatment, being in a state of alcohol or drug intoxication;
- To insert changes into the boiler's construction

To touch the combustion products outlet pipe while the boiler is in operation, as the temperature of heating of this pipe might reach more than 100 °C (for separate pipes of smoke exhaustion and air output);

- To use gas and water systems, and also the heating system, for earth bonding;
- To touch the boiler if you are standing barefoot (or your shoes are wet) on wet floor;
- To effectuate boiler treatment if it is not disconnected from the electric network and gas system;
- To insert changes into the safety and control systems operation with no permission and indication from the boiler's manufacturer
- To damage and deform the elements of electrical wiring of the boiler, even if the electric power supply is disconnected;

- To expose the boiler to the impact of atmospheric precipitations.
 - In order to avoid poisoning with carbonic oxide the premise where the boiler is installed must have the ventilation providing air exchange of not less than one premise volume per hour.
- In case of long-term idle state of the boiler in winter or if pipe freezing danger appears it is necessary to drain the water out of the boiler and the heating system.
- Do not keep highly flammable and volatile substances (gasoline, solvents etc.) in the premise where the boiler is installed.

At the boiler's normal operation and when the gas pipeline is in good order there should not be the smell of gas in the premise.

IF YOU FEEL THE SMELL OF GAS:

- 1) Close the gas supply tap, that it situated on the gas pipeline next to the boiler;
- 2) Open the windows and doors in order to ventilate the premise, providing maximum fresh air inlet;
- 3) Do not use electric appliances in order to avoid the appearance of spark;
- 4) Do not use the telephone in a gas-polluted premise
- 5) Do not smoke and do not use open fire (lighters, matches etc.)
- 6) Call the gas facility emergency operation service immediately

Usage of the boiler when it is out of order or non-compliance with the above-listed rules of exploitation may lead to an explosion or fire, or poisoning with gas or combustion products.

The first symptoms of poisoning are: heaviness in the head, strong palpitation, buzzing in the ears, swimming of the head, general weakness. Later scant of breath, nausea, vomiting and disordered motor function may appear. The injured person may lose consciousness.

In order to provide first aid at gas poisoning or combustion products poisoning it is necessary to:

- 1) Bring the injured person outdoors into the fresh air;
- 2) Call the ambulance;
- 3) Unclasp clothes that constrain breath;
- 4) Give household ammonia to smell;
- 5) To cover warmly, but not letting to fall asleep.

Prehospital service at electricity impact must be provided immediately, if possible at the place of the accident, calling the ambulance at the same time.

First of all the injured person must be released from the electricity impact as soon as possible. If it is not possible to disconnect the electric installation from the electricity network, you should immediately start releasing the injured person from conductive parts, using isolating objects.

Releasing the person from voltage, you should use a rope, stick, plank or any other dry object which doesn't conduct voltage.

Prehospital service after releasing the injured person depends on his state. If he is conscious, you should provide him profound rest, not letting him move before the doctor arrives.

If the injured person breathes very poorly and convulsively, but the pulse can be felt, you must immediately do the mouth-to-mouth or mouth-to-nose resuscitation.

In case if there is no breath you must immediately bring the injured person to a warm premise with fresh air and make resuscitation before the doctor arrives.

2. TECHNICAL DESCRIPTION

2.1 Boiler's destination

The wall-mounted double circuit heating boiler with forced water circulation and closed combustion chamber «BaltGaz NEVALUX-7224», hereinafter referred to as "boiler", is produced according to TU 4931-011-26985921-2012 (GOST R 51733-2001, GOST 20548-93).

The boiler «BaltGaz NEVALUX-7224» is designed for heating leaving and non-dangerous industrial premises with an area up to 240 m². Also, the boiler is designed for domestic hot water (hereinafter referred to as "DHW") heating for sanitary purposes.

2.2 Technical characteristics

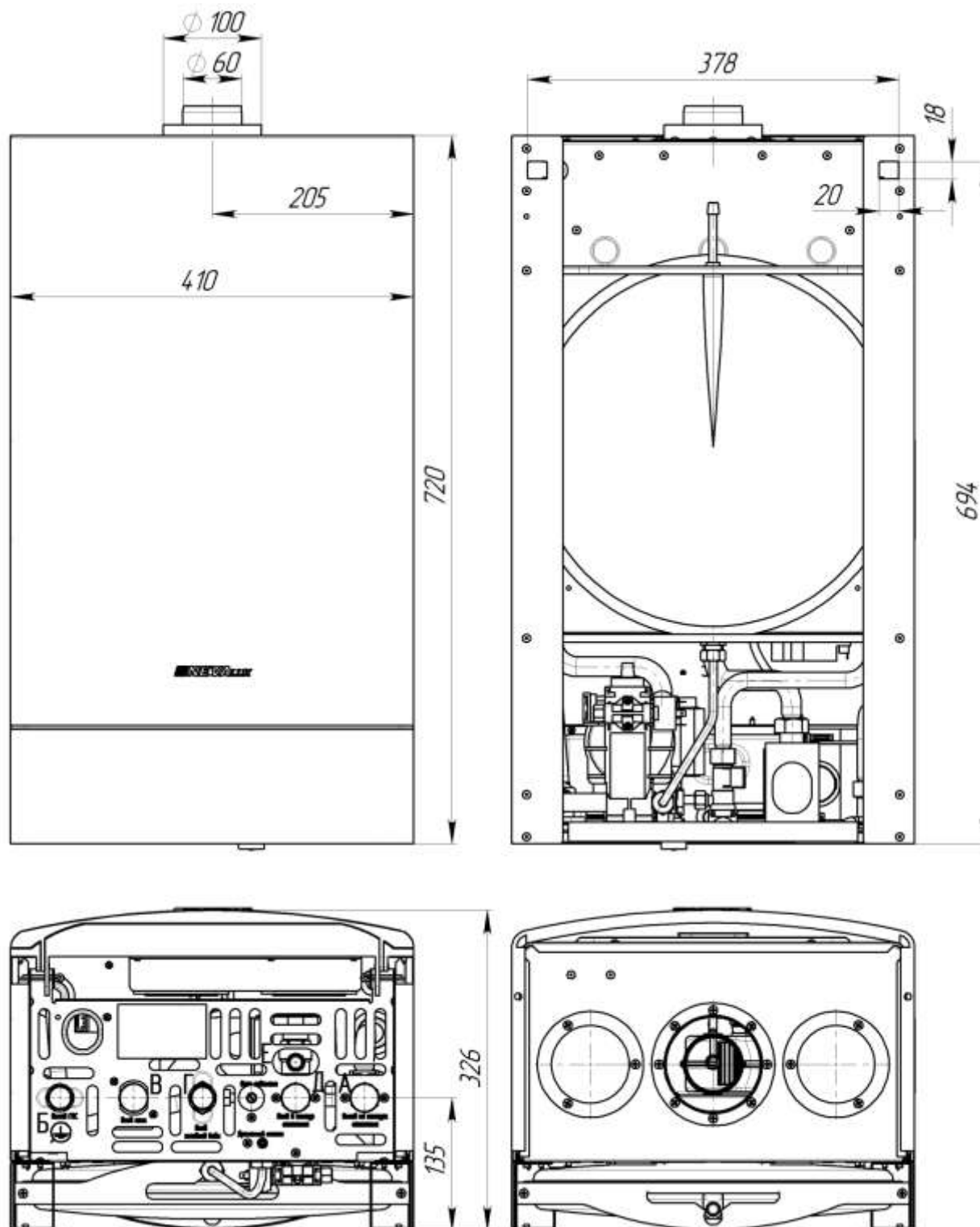
Table 1

Boiler brand		BaltGaz NEVALUX-7224
Gas type		Natural G20 / Liquified G30
Family; gas group		2-e; H / 3-e; B/P
Gas pressure in the duct	kPa	1,3 – 2,0/2,9
Minimal heating effect	kWt	8,9
Performance index at rated heating	%	90,0

power , not less than		
Performance index at rated heating power 30%, not less than	%	87,0
Heating circuit: Rated heating effect	kWt	24,0
Rated heating power	kW	26,7
Rated gas consumption	M ³ /h	2,95/1,00
Temperature regulation range	°C	30 ÷ 85
Operating water pressure	MPa	0,1 ÷ 0,2
Maximum water pressure	MPa	0,3
Volume of inserted expansion tank	l	6,0
Air pressure in the expansion tank	MPa	0,1
Hot water supply circuit: Rated heating effect	kWt	24,0
Rated input heating power, Qnom	KW	26,7
Rated gas consumption	m ³ /h	2,95/1,00
Water consumption at heating for ΔT=25 °C	l/min	14,0
Temperature regulation range	°C	30 ÷ 60
Operating water pressure	MPa	0,02 ÷ 0,60
Minimal water pressure, Pmin	MPa	0,015
Maximum water pressure, Pmax (at heat extension of water the pressure must not exceed this level)	MPa	1,0
Minimal water flow for switching the boiler on	l/min	2,5
Minimal water flow for switching the boiler off	l/min	1,5
Specific water consumption, D	dm ³ /min	11,6
Mass consumption of combustion products	g/s	17,0/18,5
Average combustion products temperature	°C	120
Type of combustion products output	Forced	
Heat-transfer medium	Water	
Water circulation type	Airtight forced circulation	
Ignition type	Automatic ignition, electronic ignition	
Maintenance of set temperature	Automatic maintenance with accuracy ±1 °C	
Temperature indication	LCD display	
Rated power tension	V	220 ±10%
Rated electric current frequency	Hz	50
Maximum electric power consumption	kW	0,125
Safety fuse	A	2
Electrosecurity class	I	
Protection rate	IP X4D	
Overall dimensions: height widths x depth	mm	720x410x326
Net/ Gross weight	kg	34,0 / 36,5
Connection dimensions: Gas inlet	inch	G3/4
Heating circuit inlet and output	inch	G3/4
Hot water supply circuit inlet and output	inch	G1/2
Inlet air orifice/ Output orifice for combustion products (for coaxial	mm	Ø100 / Ø 60

pipes)		
Inlet air orifice / Output orifice for combustion products (for separate pipes)	mm	Ø 80 / Ø 80

2.3. Overall and connection dimensions



- A- Heating circuit output Г-Cold water inlet G1/2
 G3/4
 Д- Heating circuit inlet G3/4(reverse)
 Б-DHW output G1/2; Е- Safety valve connection pipe Ø16 / Ø18 mm
 В- Gas inlet G3/4

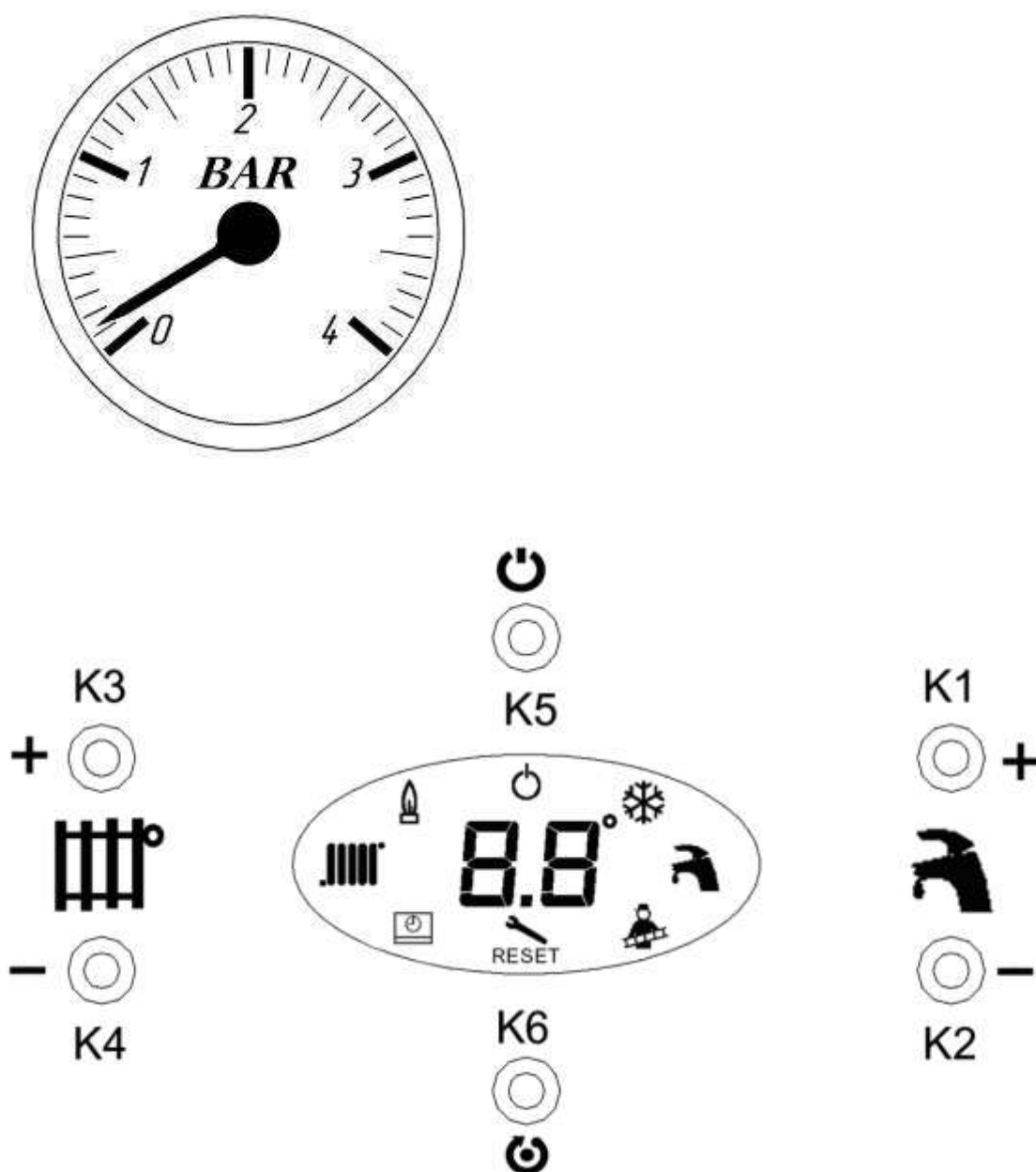
Scheme 1. Overall and connection dimensions of the boiler

3. USER'S MANUAL

3.1. Control Panel

The main control element of the boiler is the electronic board which controls all boiler's operation. The electronic board's microprocessor collects and processes signal from the control and safety sensors. All information about the boiler's condition is displayed on the LCD display in real-time operation mode.

All control over the boiler is effectuated from the control panel, the appearance of which is shown on Scheme 2. If a remote control is connected to the boiler, than control is effectuated from it, the buttons of the control panel are inactive.



Scheme 2. Boiler's control panel

In the left part of the control panel there is a pressure gauge, indicating the pressure inside the heating circuit. Water pressure in the heating circuit must be not lower than 1 bar (with pressure lower than 0,5 bar the safety system will be switched on and it would be impossible to put the boiler into operation).

In the center of the control panel there is an LCD display, showing the temperature in currently active mode at normal operation of the boiler (at operation in the heating mode it shows the water temperature in the heating system by the output from the boiler, at operation in the DHW mode –the DHW temperature by the output from the boiler). In case of failure the error code appears on the display instead of temperature. The boiler's error codes are represented in the p. 14.1 (page 29).

The symbols on display show the boiler's operation mode. Around the display there are 6 boiler control buttons. The designation of the control buttons and of the symbols shown on display are represented in the tables 2 and 3 respectively.

Control buttons designation

Table 2

Symbol	Function
K1	DHW temperature increase
K2	DHW temperature reduction
K3	Heating temperature increase
K4	Heating temperature reduction
K5	Choosing the boiler's operation mode, switching the boiler on/off (see p.3.2)
K6	Reset of the boiler's electronic board blocks (RESET)

User's manual

Displayed symbols designation

Table 3

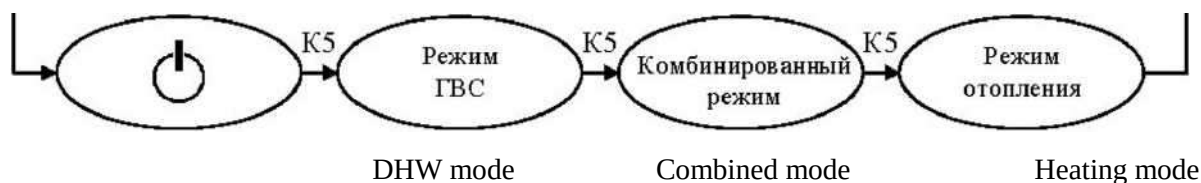
Symbol	Is always glowing	Flickering
	Antifreeze function operating symbol (see. p. 3.3.1, page9)	
	Presence of flame on the burner	
	Standby mode	
	Boiler in the DHW standby mode	Boiler operating in the DHW mode
	Boiler in the heating standby mode	Boiler operating in the heating mode
RESET	Error code, reset request	
	Error code, technical service required	
	Parameter programming (see p.13.3.1, page26)	
	Parameter number displayed	Parameter value displayed
	Remote control is connected	Remote control connection error

3.2. Boiler operation modes

The boiler can function in the following modes:

- ☐ Standby mode (see p.3.2.1);
- ☐ DHW mode (see p. 3.2.2);
- ☐ combined mode (see p.3.2.3, page9);
- ☐ heating mode (see p.3.2.4, page9);

When the boiler is connected to the electricity network, it automatically sets up to the mode in which it was before being switched off from the network. Change of boiler's operating mode is effectuated by pressing the K5 button on the boiler's control panel (see p.3.1, page7). Below the sequence of the boiler's operating modes change is represented.



Scheme 3. Sequence of the boiler's operating modes change.

3.2.1 Standby mode

In the standby mode, when the boiler is waiting for the user's commands, the symbol  is shown on display. The boiler is not in operation, but the possibility of switching on the antifreeze functions (see p.3.3.1, page 9) and parameters programming (see p.13.3.1, page 26) remains.

3.2.2. DHW mode

In the DHW mode the boiler is operating only for the DHW system. The boiler ignores the signals of the room thermostat and the heating circuit temperature sensor 10 (see p.3.3.3, page 9). If hot water is not used, the

symbol  is constantly shown on display. When hot water is used, the symbol  is flickering. The water temperature regulation range is $30 \div 60$ °C.

CAUTION! The possibility of set temperature support in the DHW mode is limited by the boiler's minimal heating effect - 8,9 kW. So in case of higher water temperature by the DHW supply circuit inlet (during the summer season) and its small consumption the temperature by the DHW supply circuit output might be much higher than the set one. In order to reduce water temperature in this case you need to increase its flow through the DHW supply circuit. This aspect of the boiler's operation is not a failure and permits to save the principal possibility of the boiler's operation in DHW mode in given conditions.

3.2.3 Combined mode

In the combined mode the boiler operates both for heating and DHW. While operating in this mode the

symbols  and  are shown on display. If there is no water flow in the water supply line the boiler operates in the heating mode (the symbol  is flickering and the symbol  is glowing). If hot water is used, the boiler automatically switches to the DHW mode (the symbol  is glowing, and the symbol  is flickering).

3.2.4. Heating mode

In the heating mode the boiler operates only for the heating system. The boiler ignores the signal from the

flow sensor of DHW 15 (see p.13.1, page 24). In this mode the symbol  is flickering on display. The heating system temperature regulation range is $30 \div 85$ °C.

3.3. Additional functions

The boiler is provided by additional functions that may be used under several operation modes. These functions provide additional safety and easiness in exploitation and in the boiler's operation.

3.3.1 Antifreeze function

The antifreeze function is an inserted safety system, which automatically launches the boiler in the heating mode when the temperature in the heating system reduces for less than $+ 8$ °C and switches the boiler off when the water temperature reaches the level of $+ 30$ °C. This mode is activated automatically in case if the following conditions are fulfilled:

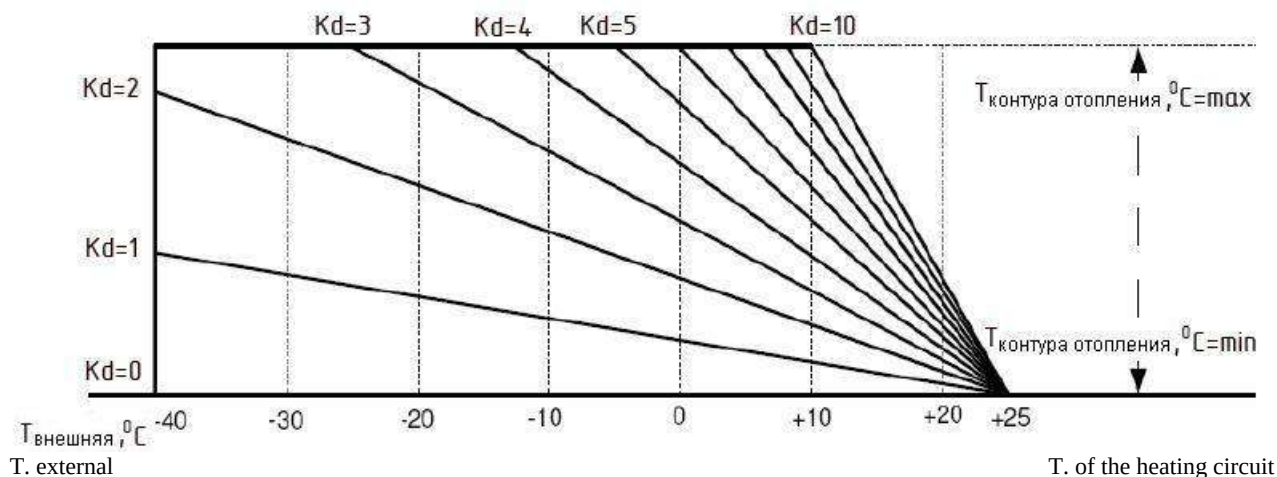
- The boiler is connected to the electricity network and to the gas pipeline;
- The boiler is not in blocked position because of failure;
- The pressure in the heating system corresponds with the set parameters.

3.3.2. Anti-blocking function

The pump anti-blocking function permits to exclude blocking of the pump shaft in case of the boiler's long-term idleness. This function works only in standby mode. Once in 24 hours the pump is launched for 15 seconds.

3.3.3. Boiler's operation in heating mode with an external (outdoor) temperature sensor

For an optimal temperature regulation in the heating circuit depending on external temperature it is recommended to use an external (street) temperature sensor. The correction of water temperature in the heating circuit is effectuated in accordance with the external temperature and regulation coefficient K_d (see Scheme 4). The electronic board automatically discerns the presence of an external sensor and effects the temperature regulating function. At water temperature setting in the heating circuit the value of the K_d coefficient is shown on the boiler's control panel's display instead of the temperature value. The regulation coefficient may be set in a range between 0 and 9.9. Please see the recommendations on connection of the external sensor in p. 10.3.3, page 21.



Scheme 4. Schedule of dependency of the temperature in the CH from the external temperature.

3.3.4. Boiler's operation at low /high source voltage

When the source voltage comes outside the range $190 \div 250$ V the electronic board renders the boiler into the standby mode. At this moment the symbol – is shown on the boiler's display and the boiler does not react on pushing the control buttons.

In 30 seconds after voltage recovery in the range of $190 \div 250$ V the boiler's operation is automatically restored in the mode in which the boiler was before, before voltage comes outside the range $190 \div 250$ V.

4. BOILER SERVICE

In order to provide long-term and failure-free boiler operation and to keep its operational characteristics it is necessary to regularly effect the examination, treatment and technical service of the boiler.

Examination and treatment must be effectuated by the boiler's owner.

Boiler technical service can be effectuated only by a specialized service organization not less than once a year. The recommended time for technical service is before the heating season.

Boiler technical service might be required more often than once a year, in case of intensive work of the boiler in a premise where there is much dust in the air or in case of higher water hardness. The unscheduled boiler cleaning must also be effectuated also in case if in the premise where the boiler is installed there were construction or reparation works and much construction dust and waste got into the boiler.

CAUTION! Works connected with technical service are not warranty liabilities of the manufacturer company and are effectuated by the customer's cost.

4.1 Examination

Every time before putting the boiler into operation during the heating season once a day, it is necessary to:

- Make sure that there are no highly flammable objects next to the boiler or next to the smoke exhauster;
- Make sure that there is no smell of gas inside the premise, is the smell of gas in the premise was detected you must address to the gas facilities service;
- Make sure that there are no water leaks in the heating and hot water supply systems, in case if leaks are detected you must address to a special service organization;
- Make an external examination of the smoke exhauster in order to detect damages. If smoke exhauster damages are detected, you must address to a special service organization.

4.2 Boiler treatment

-The water filters of the heating and DHW supply systems must be cleaned regularly, especially before the beginning of the heating season. The DHW filter must also be cleaned at water flow reduction in the DHW supply line;

- The air from the heating system must be removed from time to time (see section 10, page 19);
- The heating system must be filled with water until the needed pressure is reached (see section 10, page 19);
- The boiler must be kept clean, for this it is necessary to remove dust from the boiler's front surface regularly, and also to clean the boiler's coating first with a wet wiper and then with a dry wiper. In case of bigger dirtying you should first wipe the boiler's coating with a wet wiper, moistened in a neutral detergent, and then with a dry wiper. It is prohibited to use detergents of heightened effect and containing abrasive particles, gasoline and other organic solvents for cleaning the coating's surface and plastic details.

CAUTION! Do not change the water in the heating system unless necessary, it will permit to reduce scum formation in the heat exchanger. Before coming long-term idleness of the boiler in winter time it is necessary to drain the water from the heating system in order to avoid damaging the pipelines when it freezes.

CAUTION! All boiler treatment operations must be effectuated only after it is disconnected from the network and has cooled down.

Technical staff manual

4.3 Operations effectuated at technical service

At technical service the following operations are effectuated:

- 1) Cleaning of the burner assembly (burner);
- 2) Cleaning of the heat exchanger from soot and cleaning (washing) the pipes from scum (if necessary);
- 3) Replacement of grease retainers in the gas and water systems;
- 4) Checking of the gas and water boiler systems air tightness;
- 5) Lubrication of flexible joints (if necessary), it is recommended to use thick lubricant greases on silicone base;
- 6) Checking of safety devices, they must work without failures;
- 7) Checking of air pressure in the expansion tank (once in 3 years), the pressure must be 1 bar;
- 8) The air inlet system and combustion products outlet must be checked for air tightness;
- 9) Water flow in DHW supply system must be enough for switching the DHW mode on;
- 10) Checking of the heating system in order to detect stoppage.

CAUTION! Technical service operations connected with disassembling of its gas or water pipelines must be effectuated only after switching off the boiler completely (taps on gas and water pipelines before the boilers must be closed, the boiler must be disconnected from the electricity network

5. STORAGE PRECAUTIONS

- The boiler is made in climatic category UHL 4.2 under GOST 15150-69 standard.
- The boiler must be stored and transported in the package only in the position indicated on the handling symbols.
- The boiler must be stored in a closed premise that guarantees protection from atmosphere and other harmful impacts at air temperature from -50°C to $+40^{\circ}\text{C}$ and relative humidity not more than 98%.
- In case of boiler storage for more than 12 month a conservation according to the GOST 9.014-78 standard.
- Inlet and output hoses orifices must be closed by cover plugs.

6. GENERAL REQUIREMENTS

Installation, technical service and initial run of domestic gas facilities must be effectuated in accordance with local requirements, more specifically:

- ☐ ☐ SNiP II-35-76 «Boiler-plants»;
- ☐ ☐ SP 62.13330.2011 «Gas-distribution systems. Updated edition SNiP 42-01-2002»;
- ☐ ☐ SP 41-108-2004 «Door-to-door heating of domestic buildings with gas-fueled heat generators»;
- ☐ ☐ SNiP 41-01-2003 «Heating, ventilation and conditioning»;
- ☐ ☐ «Regulation of fire safety in Russian Federation» (PPB 01-03);
- ☐ ☐ PUE «Electrical Installation Regulations».

Also it is necessary to pay CAUTION to the following moments:

- The boiler may be used with any type of heat exchangers (convectional stoves, radiators and convectors), and their power system may be both double-pipe and single-pipe;
- Children must be kept away from contact with package elements (plastic bags, polystyrene etc.), as they represent a potential source of danger.

The boiler's initial run and warranty liabilities must be fulfilled by a special service organization.

6. OPERATIONS BEFORE INSTALLATION

CAUTION! Boiler installation, putting the boiler into operation and technical service can be effectuated only by a specialized service organization. Boiler installation must be effectuated according to the project which complies with the requirements of Federal and local normative acts, regulating gas appliances installation.

The boiler is designed for heating water to the temperature lower than the boiling point at atmospheric pressure.

The boiler should be connected to the heating system, and also to the water supply network in order to receive domestic hot water for housekeeping needs (hereinafter referred to as DHW), and after that to the gas pipeline. Heating and water supply systems must be compatible with the boiler's exploitation characteristics and power. Boiler's technical characteristics are represented in p.2.2. (page 5).

Before putting the boiler into operation it is necessary to effect the following:

- To check the compliance of the type of gas and pressure indicated in the sections 20 and 21 (page 40) and in the table of the boiler with the used type of gas and gas pressure in the place of the boiler's installation. In case of non-compliance it is necessary to render the boiler to the used type of gas and pressure in accordance with section 12 (page 23);

- To make sure that the installation was correct and the smoke exhauster is airtight;

- In order to provide correct boiler operation and to keep the warranty it is necessary to follow the requirements of this manual.

7.1 DHW System

For normal boiler operation it is necessary to install a water filter before the boiler on the DHW line.

If water hardness exceeds 200 mg of calcium carbonate per 1 liter water, it is necessary to install a polyphosphates dose meter or another water softening device.

7.2. Heating system

The boiler is connected to the heating system and hot water supply system (DHW), in accordance with its characteristics and heating power.

Minimal heat output of the heating system must be more than 8,9 kWt. Otherwise, the boiler will operate unstably, what would lead to reduction of its working lifespan.

Water chemical makeup requirements are indicated in section 10 (page 19).

Presence of rust, dirt and other depositions in the heating system leads to the boiler's operation disturbance and performance degradation (overheating, noise in the heat exchanger, heating effect reduction). In connection to this, the heating system must be washed before the boiler's installation.

For this acid and alkaline-based detergents or detergents, corroding metal, plastic and rubber parts of the boiler, cannot be used.

It is recommended to use SENTINEL X400 и SENTINEL X100. The purchased heating system cleaning detergent must be used in accordance with the instruction attached to it.

7.2.1 New heating system

The new heating system, before connecting it to the boiler must be cleaned from shavings, welding lubrication burr and other undesirable materials that may have got inside of it at installation, using appropriate means for it.

7.2.2. Existing heating system

The existing heating system must be cleaned from accumulated dirt, rust and scale deposits, using appropriate means for it.

7.3. Selection of an additional expansion tank

The membrane type expansion tank, installed into the boiler is designed for connection of the boiler to the heating system with a capacity of not more than 70 liters. If the boiler is connected to the heating system with bigger water volume, it is necessary to install an additional membrane expansion tank. Indications on selection of an additional membrane tank are represented in Annex II (page 51).

8. BOILER INSTALLATION

8.1. Mounting the boiler to the wall

- The boiler must be installed in kitchens or other non-living heated premises in accordance with the gasification project, the set of rules SP 62.13330.2011, SP 41-108-2004 and Regulations of fire safety of Russian Federation (PPB 01-03);

- in accordance with p. 4.2.7, 4.2.10 and 4.2.11 SP 41-108-2004 the boiler installation should be provided in the following conditions:

- On the walls made from non-flammable (NG) or low-flammable (G1) materials;

- On the walls covered by non-flammable (RG) or low-flammable (G1) materials (for example roofing steel on a sheet of heat-insulating layer of non-flammable materials not less than 3 mm thick; lime plaster not less than 10 mm thick)

on a distance of not less than 3 cm from the wall. The above mentioned wall covering must get outwards the boiler's coating's dimensions for not less than 10 cm;

-Placing the boiler above the gas stove or kitchen sink is prohibited;

-In front of the boiler there should be a service zone of not less than 1 meter;

- You should choose a place for installing the boiler taking into account the fact that for convenient service a free space of not less than 150 mm on the boiler's lateral sides and not less than 200mm under it is needed. The boiler's overall dimensions are represented on Scheme 1 (page 6);

- Mark the boiler's attachment points, applying the carriers from the supply package and perforate holes Ø 10 mm. In order to mark the holes on the wall it is recommended to use a harness board, included in the boiler's supply package. Put the wall dowels from the supply package into the holes and fix the boiler mounting carrier, using the screws from the supply package;

-hang the boiler by the mounting holes, located on the channel bars, on the hooks of the carrier.

8.2 Connecting the boiler to the heating system and the DHW system

- Connecting the boiler to the heating system and the DHW system must be made with metal pipes or flexible hoses with inner diameter not less than 20 mm for attaching them to the heating circuit and not less than 15 mm for attaching them to the water supply system. The hoses must be resistant to the inlet water with set parameters of pressure and temperature. The hoses must be not more than 2,5 meters long. The hoses should be installed in accordance with the instructions of their manufacturer;

-We strictly recommend to install two stop valves G3/4" by the inlet into the heating system and the output from it (they are not included in the delivery package) in order to effect the technical service operations without water drain from all the heating system;

-In order to avoid boiler's heating circuit's dirtying on the heating system's reverse line (before the boiler) it is necessary to install net filter ("mud flap") and slime tank;

-A stop valve G1/2" (not included in the supply package) must be installed on the DHW line before the filter.

-Remove cover plugs from connection pipes;

-connect the boiler to the heating and water supply systems. Check the joints' air tightness.

-CAUTION! The heating circuits pipelines must pass through inner heated premises, otherwise water freezing inside of the heating circuit is possible at sub-zero temperature of surrounding air.

8.3. Connecting the boiler to the gas system

- In accordance with p. 7 SP 62.13330.2011, the connection of the gas line to the boiler should be made with metal pipes (steel and copper) and heatproof multi-layered polymer pipes, including also one metal layer (metallopolymeric pipes). Multi-layered metallopolymeric pipes can be used for inner gas pipelines at natural gas provision to one-flat domestic buildings not higher than 3 floors in condition if they are confirmed as acceptable for construction use. The boiler may be connected to the gas pipeline by a flexible tubing (hose), resistant to transported gas at set pressure and temperature. The inner diameter of pipes and hoses must be not less than 20 mm.

In accordance with p. 5.5 SP 41-108-2004 the flexible connections shall be not longer than 1,5 m. The hoses must be installed in accordance with the instructions of their manufacturer.

- Remove cover plugs from connection pipes;

-Install the gas filter and stop valve on the gas pipeline before the boiler;

-The gas valve must be easily accessible;

-Connect the boiler to the gas pipeline. Check that there are no gas leaks. Air tightness control is effectuated by means of a soap solution bubble test on the joints or by other safe methods. Appearance of bubbles means that there is a gas leak. The gas leak is unacceptable.

8.4. Connecting the boiler to the balloon with liquefied gas

-Before connecting the boiler to the balloon with liquefied gas make sure that your boiler is set up for operation with this type of gas. Otherwise it is necessary to effect the boiler's rendering to liquefied gas in accordance with section 12 (page23).

-The balloon with liquefied gas must necessarily be equipped with a reduction unit with vapor phase stabilization pressure of 2,9kPa and vapor phase capacity not less than 1 m³/hour.

CAUTION! Using reduction units with stabilization pressure different from 2,9 kPa IS PROHIBITED.

-The hose length for connecting the boiler must be not more than 1,5 m., the inner diameter- not less than 20 mm. The gas supply hose must be resistant to the supplied gas at set pressure and temperature. The hoses should be installed in accordance with the instructions of their manufacturer.

-Before the boilers inlet a stop gas valve must be installed, which must be easily accessible.

-After finishing the installation it is necessary to check the joints and the whole length of the connection hose in order to detect a gas leak (see p. 8.3)

In order to avoid accidents it is PROHIBITED:

1)To keep gas cylinders and lay hoses under direct sunlight, next to heat sources (heating stove, oven, heating radiators, other heating appliances);

2) To heat the cylinders by means of flame or heating appliances;

3) To use damaged gas cylinders.

It is recommended to keep gas cylinders in a special metal cabinet in order to limit access of children and unauthorized persons to them. Placing gas-cylinder installations inside the building is unacceptable.

8.5 Connecting the boiler to the power line

The boiler corresponds to the I class electric shock hazard protection. It is necessary to make sure that there is an AC outlet of alternate current monophasic network with rated voltage 220 V, 50 Hz frequency and with an earth bonding contact.

In order to provide safety when power supply is beyond the range of 190-250 V the electronic board renders the boiler to standby mode (see p. 3.3.4, page 10).

The boiler's earth bonding must be effectuated following all earth bonding requirements in accordance with GOST 27570.0-87 standard. The earth bonding conductor is connected to the earth bonding screw on the boiler's bottom panel (marked with the symbol ) by one end, and by the other end to the earth bonding loop of the premise where the boiler is installed. It is prohibited to use water and gas pipelines and also the heating radiators for earth bonding. The scheme of the boiler's electric connections is presented in Annex III (page 51).

Note. It is recommended to effect the boiler's connection to the power line through a voltage stabilizer in order to provide stable and failure-free operation and also to prevent the boiler's breakdown because of power line surges.

CAUTION! In case of power cable damage, in order to avoid danger, its replacement must be effectuated by a specialized service organization.

CAUTION! The manufacturer bears no responsibilities for failures caused by non-compliance with the above-listed requirements. All activities, not complying with the above-listed installation guidelines, may not only cause the boiler's breakdown, but also create a life hazard.

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9. SMOKE EXHAUSTER INSTALLATION

It is strictly prohibited to put the boiler into operation in case if the smoke exhausting pipe is not installed, in order to avoid combustion products poisoning.

The boiler has an air inlet duct for combustion and a combustion products outlet duct, what permits not to use the air from the premise. Using different component parts, you may connect a coaxial pipe (see p. 9.1 page 15) or two separate pipes (see p. 9.2, page 16) to the upper part of the wall-hung boiler with further output of them from the premise.

Herewith the pipes must comply with the following requirements:

- The pipe must be made from non-flammable material, resistant to mechanical deformations, not subject to corrosion, and fully airtight. It also must be protected from overheating, from inflammability and freezing;
- The joints of the smoke exhauster pipe must be made of thermoresistant material not subject to corrosion;
- The smoke exhauster pipe must be installed in a place available for service so that, in case of the pipe's damage, there would be no hindrance for smoke leakage elimination.

After installing the smoke exhauster, it is necessary to effect the following.

- To make sure that in the smoke exhauster there are no narrowings in the smoke exhauster, and also that outlet pipeworks of other boilers are not connected to it. It is acceptable only in case if the smoke exhauster is designed for several users and is produced in accordance with local requirements;
- If the boiler must be connected to an existing smoke exhauster, it is necessary to make sure that the latter is clean, as slag separation from the smoke exhauster's walls while the boiler is in operation might encumber the free outlet of exhausted gases.

In order to purchase the necessary parts and details of the smoke exhauster you should contact the trading organization, effecting realization of accessories for the boilers "BaltGaz NEVALUX" in your region.

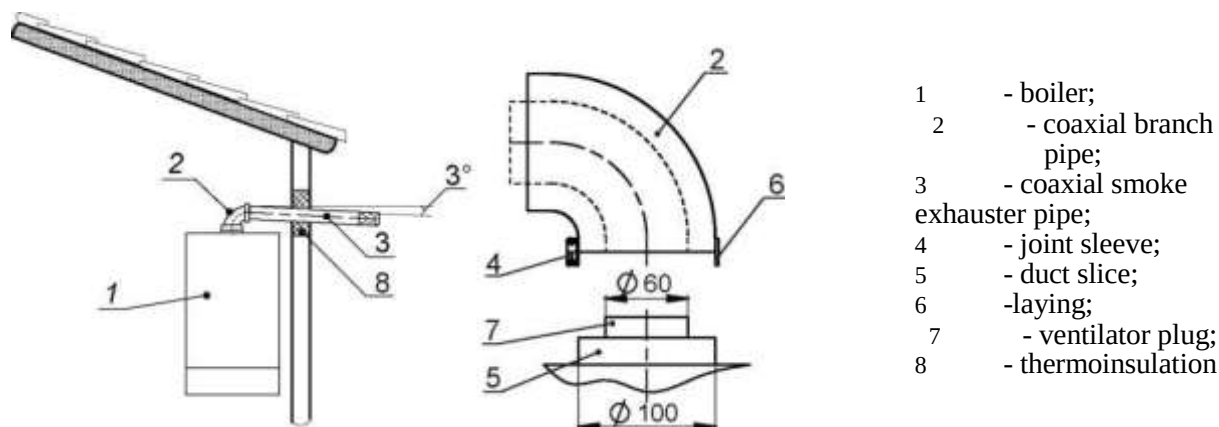
CAUTION! It is prohibited to use ventilation channels for combustion products removal.

9.1. Installation of coaxial smoke exhauster

Connecting the coaxial pipe to the boiler is effectuated by means of a connection set KHG 714101410 (not included into the supply package), which includes a coaxial branch pipe 90°, a joint sleeve for connecting to the boiler's outlet and laying (see scheme 5). If necessary the connection set KHG 714101610 can be used (not included into the supply package), with a branch pipe 45°.

When using coaxial pipes it is necessary to additionally take into account the following:

- The slope of the horizontal part of the smoke exhauster pipe must be 3° towards the street or condenser tank;
- The maximum acceptable pipe length is 4 m. Each branch pipe 90° is equal 1 m pipe, each knot bend 45° - 0,5 m pipe;
- Use branch pipes at pipe's turn points. The amount of 90° turns must not exceed three (including the branch pipe at the boiler's outlet).



Scheme 5. Installation of coaxial smoke exhauster

9.2. Installation of separate pipes of smoke exhauster and air duct

Connecting separate pipes to the boiler is effectuated with a transitional set KHG 714061510 (not included into the boiler's supply package) or a channel separator 8023-10.000 (not included into the boiler's supply package).

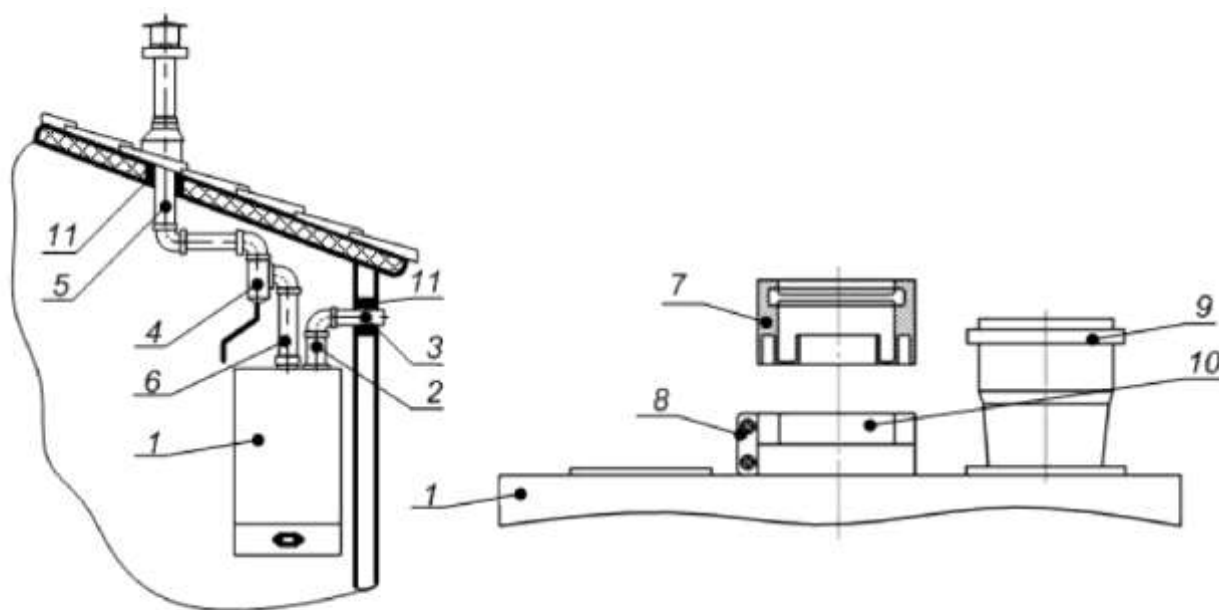
The transitional set's and the channel separator's construction provides regulation of amount of combustion inlet air with a butterfly damper. The amount of inlet air depends on pipe length and is defined with the help of gas sensor. It is necessary to turn the butterfly damper clockwise, reducing the amount of inlet combustion air, until the gas sensor detects the increase of CO level (more than 0,05%) in smoke gases. After this you should turn the butterfly damper invertedly and fix.

Using separate pipes it is necessary to additionally take into account the following:

- The total maximum pipe length must not exceed 25 m. Each 90° branch pipe is equal 1 m pipe, each knot bend 45 ° - 0,5 m pipe;
- In case of possible appearance of condensation in the smoke exhauster pipe, a condenser tank 4 must be installed before the boiler (see Scheme 6);
- The slope of the horizontal parts of the smoke exhauster pipe must be 3° towards the condenser tank (if there is one);

9.2.1. Installation of separate pipes of smoke exhauster and air duct by means of transitional set KHG 714061510

10.



- 3 -air inlet pipe Ø80 mm;
- 4 -condenser tank;

- mm;
- 7- Smoke exhauster adapting pipe;
- 8- clip;

- 10 - ventilator plug;
- 11 - thermoinsulation

Scheme 6. Installation of separate pipes of smoke exhauster and air duct by means of transitional set

The transitional set consists of details 7, 8, 9 (see Scheme 6.). The smoke exhauster adapting pipe 7 is installed to the central orifice on the upper surface of the boiler and is fixed by clip 8.

The boiler's construction provides a possibility of installation of the air duct pipe 3 (air inlet) both on the left and on the right side from the smoke exhauster pipe.

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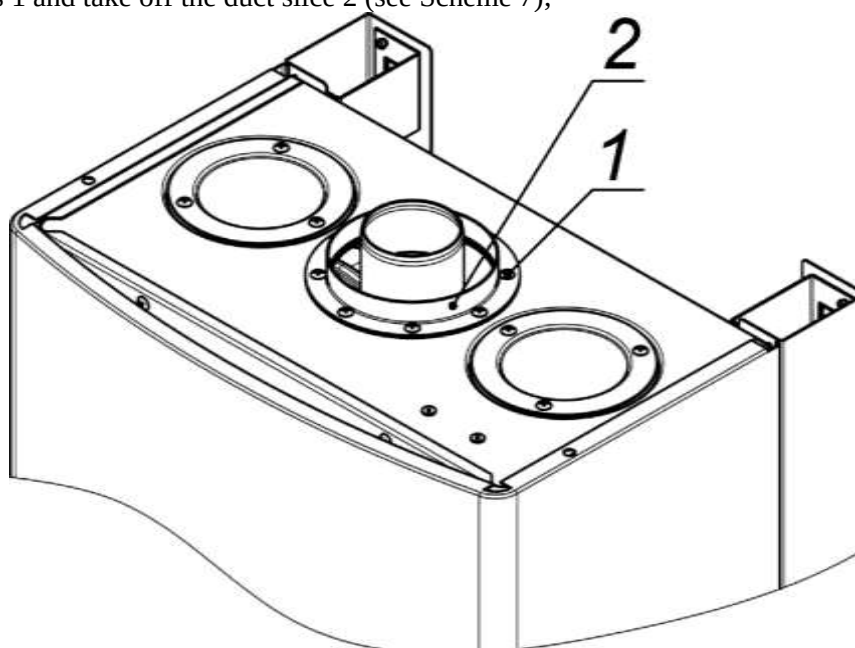
9.2.2. Installation of separate pipes of smoke exhauster and air duct by means of channel separator 8023-10.000

CAUTION! In order to install the channel separator 8023-10.000 onto the boiler you must have the following items (not included into the supply package):

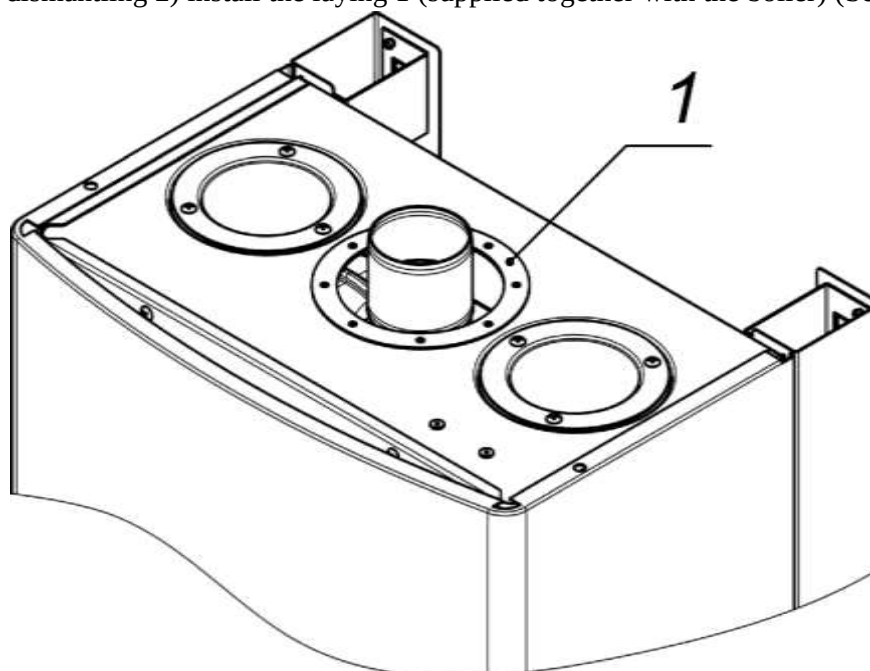
- screw (self-driving screw) Ph - 4,8x60 DIN 7981 – 4 pcs.;
- plain washer 5,3x10 DIN 125 (GOST 11371) – 4 pcs.;
- ring 005-008-19-2-2 GOST 9833-73 or a sealing laying with inner diameter 5 mm and external diameter 8...10 mm (material-paronite) – 4 pcs.;

The channel separator installation sequence:

- Unscrew eight screws 1 and take off the duct slice 2 (see Scheme 7);

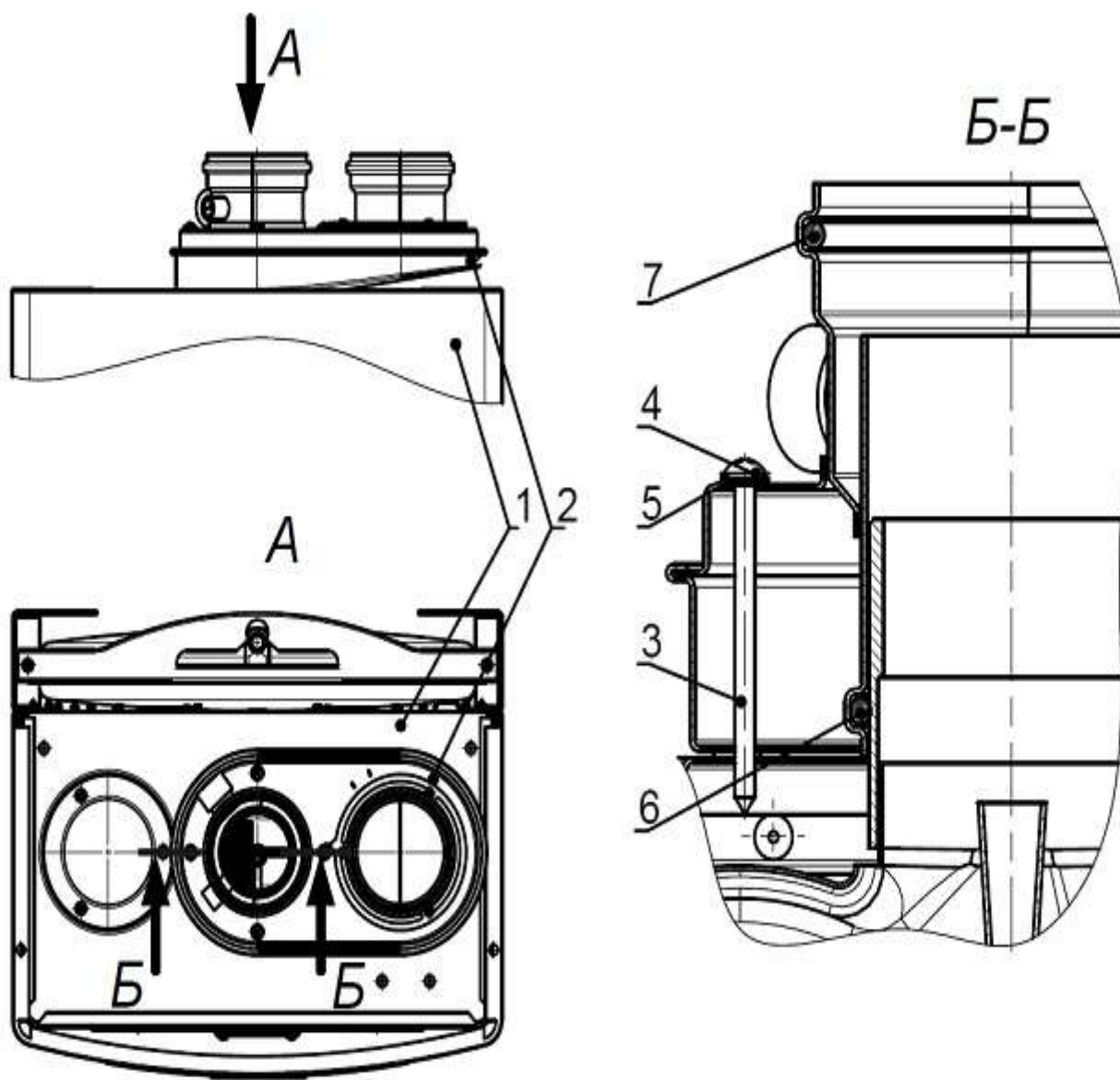


Scheme 7. Duct slice dismantling 2) install the laying 1 (supplied together with the boiler) (See Scheme 8);



Scheme 8. Plug and laying installation

- 3) Make sure that the sealing ring 6 is placed (at the place of connection of the ventilator plug) before installing the separator onto the boiler (see Scheme 9);
- 4) Install the channel separator 2 onto the boiler, controlling that the plug won't "bite on" the sealing ring 6 (see Scheme 9);
- 5) Fix the channel separator by four screws 3 (previously install first the plain washer 4, and then the ring 5 on each screw) (see Scheme 9);
- 6) Make sure that there are sealing rings 7 (2 pcs.) placed on the inlet and outlet of the channel separator before further installation of the smoke exhauster and air duct pipes (see Scheme 9);
- 7) The installation of the air inlet pipe and the smoke exhauster pipe must be effectuated in accordance with Scheme 6 (see p.9.2.1, page16).



- | | | |
|--------------------------------|--------------------------------------|-----------------|
| 1- Boiler; | 4- plain washer 5,3x10 DIN 125; | 6- sealing ring |
| 2- Channel separator | 5- ring 005-008-19-2-2 GOST 9833-73; | 7- sealing ring |
| 3- Screw Ph - 4,8x60 DIN 7981; | | |

Scheme 9. Channel separator installation scheme

10. PUTTING THE BOILER INTO OPERATION (INITIAL RUN)

As a heating agent in the heating system it is necessary to use water. The quality of water used in the heating system must comply with the following parameters:

Hydrogen ion exponent PH 6–8

General hardness not more than 4 mg-eq/L

Iron concentration not more than 0,3 mg/l

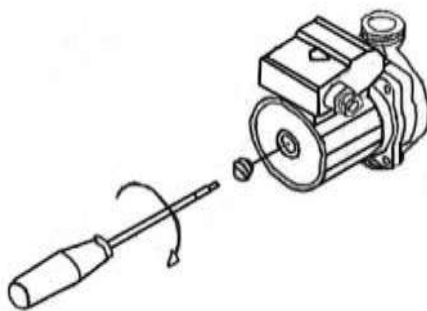
If source water hardness exceeds 4 mg-eq/l, it is necessary to install by the water inlet into the boiler a polyphosphates dose meter, that processes water coming into the boiler, protecting the heat exchange equipment of the boiler from hardness deposition. Polyphosphate dose meter is not included into the boiler's standards supply package and is purchased separately.

If source water hardness exceeds 9 mg-eq/l, more powerful water softening installations should be used.

10.1. Filling the heating circuit with water and prelaunching check

- 1) Release the air output valve 20 (see p.13.1, page24) (located on the pump19), turning off its cap for 1,5...2 turns;
- 2) Open step-by-step the cold water inlet tap on the DHW line in front of the boiler, heating circuit feed tap 16 (see p.13.1, page24) and stop valves on the direct and reverse lines of the heating circuit (if they are installed);
- 3) Close the boiler's feed tap 16, when the pressure in the heating circuit reaches 1-2 bar, in accordance with the technical characteristics table (see p.2.2, page 5) according to the pressure indicator readings. The recommended pressure is 1,5 bar.
If the pressure is lower than 1 bar it is prohibited to put the boiler into operation;
- 4) Switch the boiler on, not opening the gas tap, so that the pump completely removes the air from the heating system. Herewith the pressure may reduce lower than 1 bar and the boiler will show the error 04 (not enough water pressure in the heating circuit). In order to remove the error you need to press the button K6 (RESET) (see p.3.1, page 7).
- 5) Repeat the actions according to the points 1-4 until the pressure in the circuit stabilizes at the level of 1,5 bar, that will indicate that the air is fully removed. The installation of additional air output valves is recommended at the upper points of the heating system for more fast and complete air removal.
Before a test ignition of the boiler it is necessary to check whether:
 - 1) The boiler installation was effectuated in accordance with the requirements indicated in section 8 (page13);
 - 2) The pressure in the heating system is 1-2 bar (the recommended pressure is 1,5 bar). If the pressure is higher than 2 bar – the drain valve 13 must be opened (see p.13.1, page24), reducing the pressure for 1,5 bar. If the pressure is lower than 1 bar – the heating circuit feed tap 16 must be opened and it must be closed when the pressure reaches the level of from 1 till 1, 5 bar;
 - 3) The air inlet and air outlet pipes are installed and comply with the requirements of section9, (page15);
 - 4) The power line's voltage and frequency correspond with the levels indicated in the table (see p.2.2, page 5);
 - 5) The type of consumed gas must correspond with the type of gas indicated in the boiler's manual and the table on the boiler;
 - 6) There is no gas leak;
 - 7) The air outlet valve on the circulation pump is opened;
 - 8) The stop valves on the direct and reverse lines of the heating circuit are opened;
 - 9) The pump is not blocked. To find it out you may screw off the pump's cover plug and turn the pump shaft back and forth several times (see Scheme 10).

Scheme 10. Circulation pump check



Then screw the cover plug up tight. While effecting this operation water leaks from the pump are possible, after installing the cover plug the rests of water must be removed from the boilers components (you must wipe them);also check the boiler connection to the AC outlet of the monophase network of alternate current with rated voltage of 220V, 50Hz frequency, with an earthbonding contact;

10) Also check the heating system's airtightness.

CAUTION! Water getting onto the boilers electronic components is unacceptable!

10.2. Check of combustion properties

The boiler permit to effect the heating-performance parameters analysis not disturbing the boiler's settings. For this it is necessary to use the function of gas analysis (measuring of output gases temperature and of the content of carbonic oxide in them). Before activating this function (see p.13.2.2, page 27) it is necessary to make sure that the boiler is switched on and operates in the heating mode or in the combined mode, and the smoke exhauster pipe has an orifice for the gas sensor input on the straight section on a distance of not less than 250mm from the gas removal device outlet. During the combustion process analysis the water overheating protection system remains active, when the water reaches the temperature of 88 °C the boiler will pass to standby mode. After finishing the measurements the gas sensor inlet orifice must be made airtight.

10.3. Additional abilities (options)

10.3.1. Connection of room thermostat

For more effective operation of the boiler it has a possibility to connect a room thermostat, that is installed in the heated premise. In order to install the thermostat it is necessary to remove the plug wire from the contacts 28 and 29 (connector M10) from the room thermostat's connector (see Annex III, page 53) and place the cables with a terminal strip from the contacts 26 and 27 to the contacts 28 and 29. Then you must effect the connection of interconnecting wires of the room thermostat to the terminal strip (the thermostat's wires' connection polarity does not matter). The plug wire must be given to the boiler's owner so that he keeps it.

The room thermostat is not included in the standard supply package and is purchased separately if desired by the customer. The cable for connecting the room thermostat to the boiler is not included into the thermostat's supply package. The main requirements for choosing the cable are: the cable's maximum length is 30 meters, it consists of two wires (flexible copper multiple-core cable with cross sectional area of 0,5...1,5 mm²).

10.3.2. Remote control connection

The boiler permits to use a remote-control console (hereinafter referred to as "remote control"). The remote control has got an inbuilt temperature sensor and permits to control the boiler from a distance (not more than 30 meters from the boiler) and set the same commands as from the control panel. Also the remote control permits to control the boiler's operation, keeping the temperature set by the user in the premise. The remote control is connected to the connector M8 through the contacts 40 and 41 of the electronic board (see Annex III, page 52). While connecting the remote control it is necessary to remove the room thermostat's connector from the M10 connector and give it to the boiler's owner so that he keeps it (see p.10.3.1).

It is acceptable to connect the remote control together with the external (street) temperature sensor (see p. 10.3.3). Herewith the boiler regulates the temperature in the heating circuit either with the help of the remote control's temperature sensor, or depending on external temperature (see p. 3.3.3, page 9). The remote control can display the street temperature value.

Before connecting the remote control it is necessary to make sure that it is prepared for putting it into operation in accordance with the installation and connection manuals that are included in the remote control's supply package.

The remote control is not included in the boilers standard supply package and is purchased separately if desired by the customer. The cable for connecting the remote control to the boiler is not included in the remote control's supply package and is purchased separately. The standard cable consists of a connector for connecting the remote control to the electronic board, two wires 1 meter long and a terminal strip for connecting the wires. If the cable is long enough, it is necessary to disconnect the terminal strip and connect the cable wires to the remote control (see the instructions for the remote control). If a connection wires' length of more than 1 meter is required, it is necessary to connect two additional wires of required length to the terminal strip, herewith the wires must be convolved like a twisted pair wire. The main requirements for choosing wires are: flexible copper multiple-core cable with cross sectional area of $0,5 \dots 1,5 \text{ mm}^2$, maximum wire length is 29 meters (plus 1 meter standard cable).

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10.3.3. Connection of external temperature sensor

It is recommended to use an external (street) temperature sensor of the TPEB type. The sensor is connected to the terminal strip of the room thermostat's connector (installed into the connector M10), see Annex III, page 53). It is necessary to control that the plug wire is installed in the room thermostat's connector on the contacts 28 and 29. In case of connecting the remote control together with the external sensor to the boiler it is necessary to remove the plug wire from the contacts 28 and 29 in the room thermostat's connector and give it to the boiler's owner so that he keeps it. The cable for connecting the external sensor to the boiler is not included into the sensor's supply package. The main requirements for choosing the cable are similar to the requirements listed in p. 10.3.1. The connecting instruction of the sensor is supplied together with it.

10.3.4. Connection of a computer for diagnostics

The electronic board provides a possibility of connecting a stationary or portable computer for boiler operation parameters diagnostics to the M7 connector (see Annex III, page 53). For this a special program and an adaptor for connecting the electronic board with the computer is needed (presence of COM port on the computer is necessary).

10.3.5. Connection of several room thermostats

The electronic board provides a possibility of connecting several room thermostats additionally, located in different rooms of the house or flat, to the connector M8 (see Annex III, page 53) through the contacts 38 and 39 of the electronic board. For this a special zone control electronic board is used (not included into the standard supply package). The instruction and cable for connecting the zone control electronic board are supplied together with it.

10.4. Switching the boiler off

It is necessary to switch the boiler off before starting reparation works or maintenance service. It is recommended to switch the boiler off in the following sequence:

- 1) To render the boiler to standby mode, consequently pressing the button K5;
- 2) To disconnect the power cable plug from the AC outlet of the power line;
- 3) To close gas and water taps.

10.5. Water drain from the boiler's heating circuit

At heating circuit's elements dismantling it is necessary to drain the water from the boiler. For this it is necessary to twist off the drain valve 13 (see p. 13.1 page 24).

In case of long-term idleness of the boiler in winter time or in case of pipeline freezing danger appearance it is necessary to drain the water from the boiler and the heating system.

11. BOILER'S POWER REGULATION

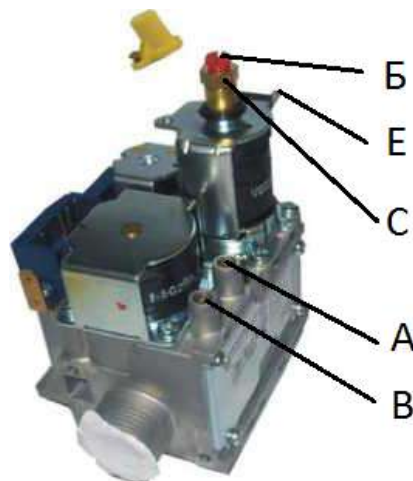
Boiler's power regulation is made by adjusting gas supply regulator.

Caution! To adjust a gas supply regulator by a non-magnetic screwdriver only!

Caution! To adjust a gas supply regulator or rendering boiler from one type of gas to another should be performed by specialized service organizations only!

11.1. Prestarting

- 1) Switch the boiler off (see p.10.4, page 21) and throw a cover of a front panel;
- 2) Unscrew 6 self-threading screws from front panel's support;
- 3) remove a front panel with a cover;
- 4) Put off a plastic cap from the regulating screw C and B (see scheme Scheme 11).



Scheme11. Gas supply regulator

11.2. Checking gas inlet pressure in the regulator

- 1) Unscrew a gauge on 1...2 turns from the control point B and connect a manometer;
- 2) Switch a boiler on and render it to the CH mode (see p 3.2.4, page.9);
- 3) Set rated power by turning on a function of gas analysis (see p.13.3.2, page 27);
- 4) Keep boiler in the CH mode within 1 minute;
- 5) Check gas pressure in the control point B. It should be 1,3 kPa – 2,0 kPa (130 - 200 mm of water column) for NG and 2,9 kPa (300 mm of water column) for LPG. In other case it is necessary to Switch the boiler off and address to the emergency service of gas facilities, telephone number 04 or replace a cylinder (for LPG);
- 6) Render boiler into stand-by mode consequently pushing a button K5 (see p.3.2.4, page 9);
- 7) Disconnect a manometer and wrap a gauge in the control point until bumping.

11.3. Regulating rated pressure

To perform regulating rated pressure you must effectuate the following:

- 1) Unscrew a gauge on 1...2 turns from the control point A and connect a manometer;
- 2) Switch the boiler on and render it to the CH mode (see p.3.2.4, page.9);
- 3) Set rated power by turning on a function of gas analysis (see p.13.3.2, page 27);
- 4) Keep boiler in the CH mode within 1 minute;
- 5) Check gas pressure in the control point A. It should be 1 kPa (105 mm of water column) for NG and 2,5 kPa (250 mm of water column) for LPG. In other case to adjust pressure by an adjusting screw C while keeping an internal screw B from turning over.

11.4 Regulating minimal pressure

- 1) Disconnect a cable from the terminal E, boiler will render to the minimal power and on the display will be mapped an error «07» (see p.14.1, page 29);
- 2) Check gas pressure in the control point A. It should be 0,15 kPa (15 mm of water column) for NG and 0,3 kPa (30 mm of water column.) for LPG;
In other case to adjust pressure by turning the adjusting screw B, while turning over an external screw C;
- 3) Connect cable to the terminal E.

11.5 End of operation

- 1) switch the boiler off;
- 2) disconnect manometer and wrap a gauge in the control point A until bumping;
- 3) put a plastic cap on the adjusting screws C and B;
- 4) Switch the boiler on and render it to the CH mode (see p.3.2, page9);
- 5) check the gas leakage in the control points A and B (see p.11.2, page 22);
- 6) render the boiler into a stand- by mode consequently pushing a button K5;
- 7) install a front panel and fix it by means of 6 self-threading screws;
- 8) close a cover of the front panel.

12. RENDERING A BOILER TO ANOTHER TYPE OF GAS

Type of gas, which a boiler is adjusted to, is indicated on the boiler body's data plate and user's manuals (see section20, page 40).

To render a boiler to another gas type it is necessary:

- 1) Switch the boiler off (see p.10.4, page 21);
- 2) Put off a casing from the boiler. For this it is necessary to unscrew 4 casing's fastening screws (self-threading screws) to the low panel of a boiler and 6 casing's fastening screws (self-threading screws) to the front panel;
- 3) Throw a front panel together with a cover down, then remove a casing while pulling it up and over yourself;
- 4) Remove a sealing cap, unscrew 4 screws (self-threading screws) and pull a cap hard up over yourself. When reassembling, take into consideration, a correct installation of the cap's sides which should enter the slots on the back side of the boiler;
- 5) Remove a manifold. For this to unscrew 2 fastening screws (self-threading screw) of the manifold to the front burner's bracket and with a turnkey 30 to unscrew a nut fixing a manifold to the gas pipe (detailed description of removing the manifold see in p.17.1, page 36);
- 6) To replace nozzles in the burner's manifold to the nozzles with aperture diameter:
 - 0,79 vv for LPG;
 - 1,31 for NG;
- 7) Remove a housing closing an electronic board by unscrewing 6 screws (self-threading screw) on the housing and mount a jumper CM1 (see Appendix, page.53) in the position:
 - "B-C" for LPG;
 - "A-B" for NG;
- 8) Adjust boiler's power (see section 11, page 22);
- 9) Assemble boiler's elements in the reverse order;
- 10) Make an entry into the section "Certificate of rendering to another gas type" of user's manual;
- 11) Make an entry on the boiler's label and in the section 21 (page 40) of the present User's manual.

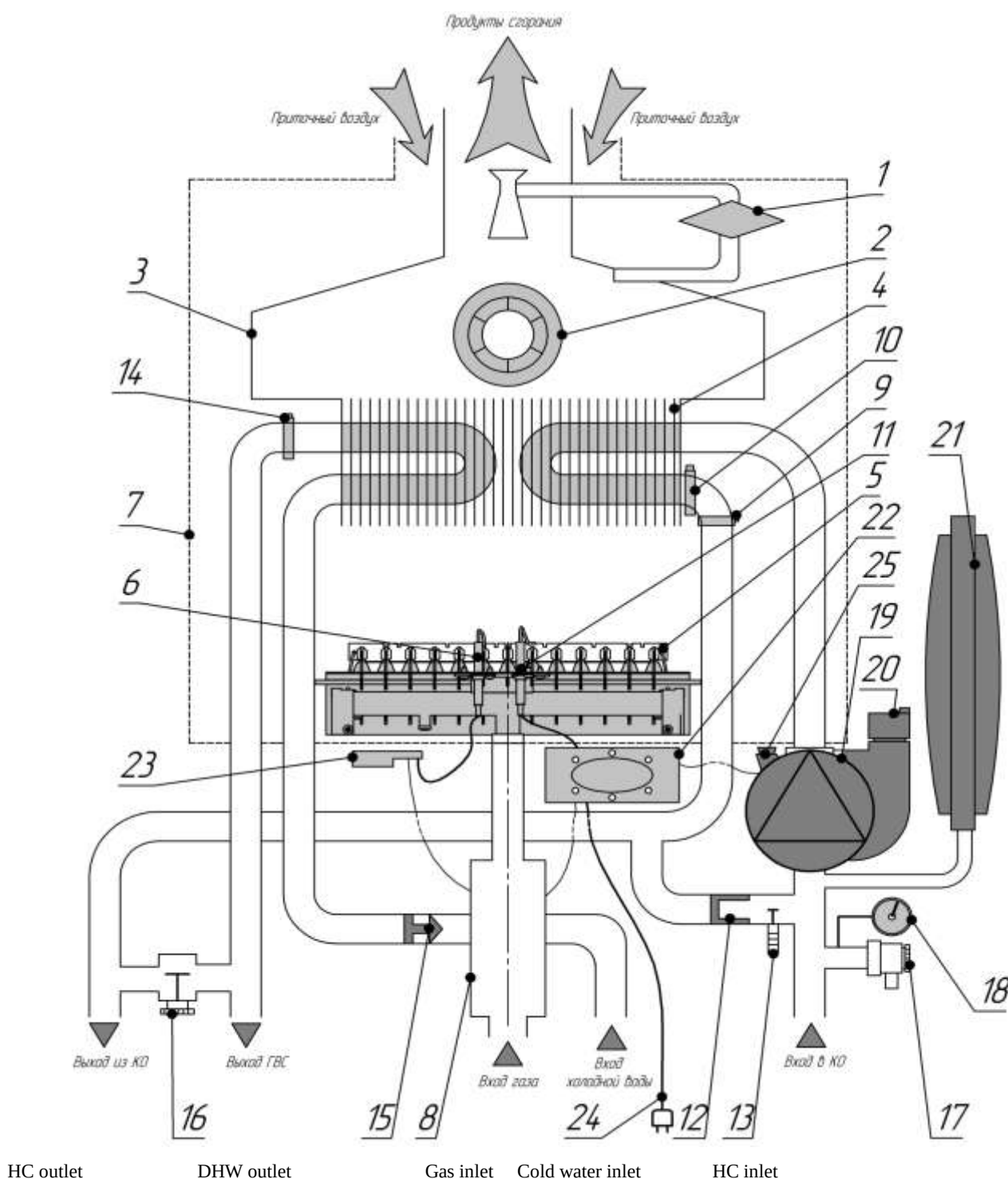
13. BOILERS FLOWCHARTS AND CONTROL BOILER'S OPERATION

13.1. Boilers flow chart «BaltGaz NEVALUX-7224»

Combustion products

Inlet air

Inlet air



- 1 - Air pressure switch;
- 2 - fan;
- 3 - exhaust flue;
- 4 - heat exchanger;
- 5 - burner block (burner);
- 6 - ignition plug;
- 7 - sealed chamber;
- 8 - gas supply regulator;
- 9 - thermo relay;
- 10 -CH temperature sensor;

- 11 -Ionization plug;
- 12 -Bypass valve;
- 13 -Drain valve;
- 14 -DHW temperature sensor;
- 15 -DHW flow sensor;
- 16 -CH feeding valve;
- 17 -Safety valve (CH);
- 18 -manometer;

- 19 -pump;
- 20 -air duct valve (automatic);
- 21 -expansion tank;
- 22 -electronic board;
- 23 -igniter;
- 24 -power cable;
- 25 - pressure sensor.

Scheme. 12. Flow chart

13.2. Main components

13.2.1. Control system

Component	Function
Electronic board 22 (see p.13.1, page 24)	To control boiler's operation and ensure safety in case of emergency
Wiring	A set of cables for connecting a board with sensors, components and mechanisms

13.2.2. Hydraulic system

Component	Function
Heat exchanger 4 (see p.13.1, page 24)	To transfer produced heat while gas burning to the heat carrier, transfer heat from heat carrier to water of DHW system.
Pump 19	A component to create a compulsory water circulation
Air duct valve 20	Automatic air removal out of the heating system
Expansion tank 21	Compensation of water expansion in CH as a result of heating

13.2.3. Gas system

Component	Function
Burner block (burner) 5 (see p.13.1, page 24)	Mixing gas and air and ensuring uniform combustion of gas-air mixture in the combustion chamber
Igniter 23	Forming a spark on the ignition plug
Ignition plug 6	To create a spark for igniting of the gas-air mixture on the burner

13.2.4. Smoke exhausting system

Component	Function
Fan 2 (see p.13.1, page 24)	Compulsory removal of combustion products

13.2.5. Regulation devices

Component	Function
For gas	
Gas supply regulator 8 (see p.13.1, page 24)	Regulate gas supply to the burner block
For water	
CH temperature sensor 10	Measuring temperature of the heat carrier. Signal from the sensor is applied for maintaining set temperature of heat carrier in CH
DHW temperature sensor 14	Measuring water temperature in DHW. Signal is applied for maintaining DHW set temperature
DHW flow sensor 15	Defining DHW water flow. Signal from the sensor is applied for rendering boiler into the DHW mode while opening a hot water tap

13.2.6. Safety devices

Component	Function
For control	
Fuse 21 (см. Annex III, page 53)	Protect electronic board and electric circuits against overloading in the electric system and short circuit protection
For water	
Pressure sensor 25 (see p.13.1, page 24)	Control minimal water pressure and air absence in the heating system
Thermo relay 9	Protect heat exchanger against overheating
Bypass valve 12	Protect heat exchanger against overheating while increasing resistance in the heating system
Safety valve 17	Water relief out of the heating system when pressure is higher than 3 bars
Air duct valve 20	Automatic air removal out of the heating system
For gas	
Gas supply regulator 8 (see p.13.1, page 24)	Ignition at low pressure in order to avoid "clap". Blocking gas supply if emergent case happens (heat carrier overheating, absence of draught etc.)
Ionization plug 11	Flame control on the burner. If flame lacks, it stops gas supply to the burner
For combustion products	
Air pressure switch 1 (see p.13.1, page 24)	Control fan's operation. When draught is present or fan is out of control, it stops boiler's working

13.3. Service functions

13.3.1 Parameters programming function

Parameters programming function enables to modify main parameters of boiler's starting up and operating. This function works only in the stand-by mode and allows modifying the following parameters:

- "P0" – ignition power 0 ÷ 99 (100 steps);
- "P1" – minimal heating power 0 ÷ 39 (40 steps);
- "P2" – minimal heating power 40 ÷ 99 (60 steps);
- "P3" – minimal time from turning off until restarting working 0 ÷ 14 (min).

Factory settings of the boiler «BaltGaz NEVALUX-7224»: "P0"=40 for boilers working on NG, "P0"=60 for boilers working on LPG, "P1"=0, "P2"=99, "P3"=3 min.

To use a parameters programming function it is necessary:

- 1) Switch the boiler off consequently pushing a button K5 (see scheme. 2, page 7), until a symbol  is mapped;
 - 2) Disconnect boiler from the power line;
 - 3) Connect boiler again to the power line. Within 5 seconds there is a chance of activating of the programming function;
 - 4) Push and simultaneously press buttons of temperature reducing DHW and CH (K2 and K4) for activating parameters programming function;
 - 5) Release the buttons when a code "P0" and symbol  will be mapped on the display;
 - 6) Choose a parameter which you would like to change pressing the buttons K3 or K4;
 - 7) Push the button K5 in order to display a parameter value. Symbol  starts blinking;
 - 8) To change the value of the chosen parameter by pressing a button K1 (increasing) or K2 (value reducing). Keep the button K1 or K2 pressed for increasing speed of changing parameter;
 - 9) Press button K5 in order to keep a set parameter value and come back to choosing parameters;
 - 10) To repeat cycle starting from p.6 in order to modify all the parameters which you would like to change;
 - 11) Press button K6 (RESET) to escape from programming mode.
- Do not change a parameter P3 without any emergency.

13.3.2 Gas analysis function

Gas analysis function enables to control, analyze combustion process and adjust a gas supply regulator (see p.11.2 and 11.3, page 22). This function works in CH and Combined modes.

To activate a gas analysis function it is necessary to hold the button K6 (RESET) until a symbol  will be displayed. Within 15 minutes a boiler will work on the rated power. Afterwards it will automatically come back to the operating mode. To turn the gas analysis function off before than in 15 minutes it is necessary at first to Switch the boiler off and then switch it on using a button K5.

13.4. 13.4. Boiler's operating logic

Boiler's starting up in the heating mode happens if actual water temperature in the heating system is lower than a set one for 5 °C. Boiler starts up working in DHW mode if there is water flow in DHW line present.

The following pre-starting operations happen while a boiler starts up:

- 1) Electronic board 22 (see p.13.1, page.24) checks voltage;
- 2) Water pressure sensor 25 works out. Signal about water presence in CH goes to the board. If CH is not full, boiler's starting up stops;
- 3) Electronic board checks status of the thermo relay 9 and operating conditions of CH temperature sensors 10 and DHW 14. Failure of any of these sensors causes the stoppage of boiler's starting cycle;
- 4) On the display of control panel is mapped a value of CH and DHW water temperature (depends on operating mode).

If boiler's starting up stops due to any failure, an error code is displayed (see p.14.1, page 29).

13.4.1. Boiler's operating in CH:

- 1) Electronic board 22 (see p.13.1, page 24) provides voltage to the pump 19 (to check the voltage on the pump's terminals is possible by means of a tester). Pump starts working (noise of running pump is heard);
- 2) Electronic board 22 inquires an air pressure switch 1, its pins should be open. If they are closed, boiler's starting up stops;
- 3) Electronic board provides voltage to the fan's electric motor 2. Fan starts working (it is heard). By means of the air flow there is pressure difference created in the air pressure switch 1. To the electronic board a signal about draught is provided. If signal is absent, boiler's starting up stops;
- 4) A pause for ventilation of combustion chamber is hold (it is necessary for gas removal in case of previous fail start up);
- 5) igniter 23 by the signal of the electronic board provides high voltage to the ignition plug 6 within ~ 10 seconds (sound of discharge is heard);
- 6) electronic board provides a signal for opening a gas valve in the gas supply regulator 8, and gas is coming to the burner block 5;
- 7) if ignition happened (if casing is removed, you can see the flame through the viewing window), an ionization plug 11 sends a signal to the electronic board about successful ignition. If a signal from ionization plug 11 is absent, electronic board repeats a procedure of boiler's starting up from the beginning. There are 2 consecutive start up attempts taken. If both attempts failed, electronic board stops ignition;
- 8) Electronic board changes voltage in the modulator coil of gas supply voltage 8. Gas supply regulator increases gas supply to the burner block up to maximal power in order to quickly warm the water in the heating system up to the set temperature;
- 9) Electronic board equals a signal of CH temperature sensor 10 with a value set by the user by means of buttons K3 и K4 (see p. 3.1, page 7). If the difference of set temperatures is more than 1 °C, electronic board changes voltage on the gas supply regulator in order to change gas supply to the burner block in accordance with CH requirement.

13.4.2 Boiler's operation in DHW:

- 1) DHW flow sensor 15 sends a signal (see p.13.1, page 24) about presence of water flow in DHW;
- 2) Electronic board inquires air pressure switch 1, its pins should be opened. If they are closed, boiler's start up stops;
- 3) Electronic board provides voltage to the electric motor of fan 2. Fan starts working (it is heard). Air flow creates pressure differences in the air pressure switch 1. A signal about draught presence is given to the electronic board 22. If signal is absent, boiler's start up stops;
- 4) A pause for ventilation of combustion chamber is hold (it is necessary for gas removal in case of previous fail start up);
- 5) igniter 23 by the signal from electronic board provides high voltage to the ignition plug 6 within ~ 10 seconds (sound of discharge is heard);
- 6) electronic board provides a signal for opening a gas valve in the gas supply regulator 8, and gas is coming to the burner block 5;
- 7) if ignition happened (if casing is removed, you can see the flame through the viewing window), an ionization plug 11 sends a signal to the electronic board about successful ignition. If a signal from

ionization plug 11 is absent, electronic board repeats a procedure of boiler's starting up from the beginning. There are 2 consecutive start up attempts taken. If both attempts failed, electronic board stops ignition;

- 8) Electronic board changes voltage in the modulator coil of gas supply voltage 8. Gas supply regulator increases gas supply to the burner block up to maximal power in order to quickly warm the water in the heating system up to the set temperature;
- 9) Electronic board equals a signal of DHW temperature sensor 10 with a value set by the user by means of buttons K3 и K4 (see p.3.1 , page7). If the difference of set temperatures is more than 1 °C, electronic board changes voltage on the gas supply regulator in order to change gas supply to the burner block in accordance with DHW requirement.

13.4.3 Boiler's operation in combined mode

In this type of mode DHW has a priority over CH. If water flow is absent in the DHW line, a boiler is working in CH.

If there is water flow in the line DHW, DHW water flow sensor 15 operates. A signal about presence of water flow in the DHW line is sent to the electronic board (in DHW mode a pump doesn't operate).

If there is termination of water flow in DHW line (signal from DHW water flow sensor 15 is absent) a boiler enters to the CH mode (electronic board provides voltage to the pump 19 and it starts operating).

14. SEARCH FOR FAILURES AND THEIR ELIMINATION

14.1. Error codes

Stoppage of the boiler's operation, caused by the refuse or faulty operation of any of its systems, is accompanied by an appropriate error code displayed on the boiler's control panel (see p. 3.1, page.7) which facilitates fault detection.

possible reasons and methods of troubleshooting are presented below:

Table 4

Cod e	Failure	Reason of failure	Troubleshooting
01	Defects related to the faulty ignition Boiler doesn't operate*	Failure of gas supply	Open shut-off valve on the pipeline
			Check pressure in the cylinder (LPG)
			Address to gas service
		Failure of ignition plug	Replace a plug
		Electric circuit of ignition plug is damaged	Check electric circuit and pins
		Wrong gap between ignition plug and burner blade	Install a gap ($5^{+0,5}$ mm).
		Spark of electrode of ignition plug slips on the shell of combustion chamber	Bend a shell of combustion chamber in the place of ignition plug installation
		Ignition plug is contaminated	Wipe a plug from dust and degrease
		Failure of ionization plug	Replace a plug
		Electric circuit of ionization plug is damaged	Check electric circuit and pins
		Wrong gap between ionization plug and burner blade	Install a gap ($3^{+0,5}$ mm).
		Failure of igniter	Replace igniter
		Electric circuit of igniter is damaged	Check electric circuit and pins
		Burner block is contaminated	Clean a burner block (see p.16.1.1, page 32)
		Electric circuits of gas supply regulator are damaged	Check electric circuit and pins
		Gas supply regulator doesn't work	Replace gas supply regulator
		Failure of thermo relay (normally closed at temperature up to 95 °C)	Replace thermo relay

Cod e	Failure	Reason of failure	Troubleshooting
		Electric circuit of thermo relay is damaged (overheat sensor)	Check electric circuit and pins
02	Water overheating Boiler doesn't work*	Heating system is contaminated	Clean heating system
		Failure of thermo relay (normally closed at temperature up to 95 °C)	Replace thermo relay
		Air lock in the heating system	Open air duct valve (see p. 16.2.2.5., page 34)
		Filter in the heating system is contaminated	Clean the filter
		Bypass valve is failed or wrong installed	Check proper installation of the details of bypass valve and replace it if necessary
		Pump or air duct valve is failed	Replace a pump or air duct valve
		Faulty pump relay on electronic board	Replace electronic board
		Gas supply regulator doesn't work	Replace gas supply regulator
		Gas supply regulator is not adjusted	Adjust gas supply regulator (see section 11, page 22)
		Electric circuit of thermo relay is damaged (overheat sensor)	Check electric circuit and pins
03	Draught absence Boiler doesn't operate*	Exhaust flue or air flow valve is contaminated	Figure out a reason of contamination and remove it
		Faulty leak-tightness of air pressure switch tubes	Replace tubes
		Electric circuit of air pressure switch is damaged	Check electric circuit and pins
		Faulty air pressure switch (pins of pressure switch should close at pressure drop from 130 Pa)	Replace air pressure switch
		Condensate in air pressure switch tubes	Remove condensate out of air pressure switch tubes
		Electric circuit of fan is damaged	Проверить электрическую цепь и контакты
		Failure of fan	Replace fan
04	Lack of water pressure in CH Boiler doesn't work**	Low water pressure in CH	Make CH water pressure up to the recommended value (see p.10.1, page 19)
		Air lock in the heating system	Open air duct valve (see p.16.2.2.5. , page 34)
		Failure of CH water pressure sensor	Replace a sensor
		Failure of pump or air duct valve	Replace pump or air duct valve
		Electric circuit between pressure sensor and electronic board is damaged	Check connector pins in the control block and sensor and electric circuit of a sensor
05	Failure of CH temperature sensor. Boiler doesn't work**	Failure of CH temperature sensor	Replace CH temperature sensor
		Electric circuit "temperature sensor-electronic board" is damaged	Check electric circuit and pins
06	Failure of DHW temperature sensor Boiler works in heating mode only**	Failure of DHW temperature sensor	Replace DHW temperature sensor
		Electric circuit between DHW temperature sensor and electronic board	Check electric circuit and pins

Cod e	Failure	Reason of failure	Troubleshooting
07	Failure of modulator coil of gas supply regulator Boiler doesn't work**	Broken modulator coil of gas supply regulator	Replace gas supply regulator (resistance of modulator coil 80 Ohm)
		Electric circuit "modulator coil-electronic board" is damaged	Check electric circuit and pins

* After troubleshooting it is necessary to push a button K6 (RESET)
(see p.3.1, page7);

** After troubleshooting boiler starts up automatically.

14.2 Other failures

Failures that don't have any code are displayed on the boiler's control panel (see p. 3.1, page7) as follows:

Table 5

Failure	Reason of failure	Troubleshooting
Boiler doesn't switch on	Lack of electricity	Address to the service
	Fuse is burnt	Replace fuse on the board
	Water entry on the electronic board	Dry the board by means of warm air or leave it for 2 days in a dry place for full ware evaporation
	Electronic board failure (RESET doesn't help)	De-energize and re-start boiler Replace electronic board
Claps in burner	Minimal gas pressure and ignition power are wrong adjusted	Adjust minimal gas pressure (see p.11.4, page 23) and ignition power "P0" (see p.13.3.1, page 26)
	Lack of air supply	Clean a tube or air duct valve
	Electrode spark of ignition plug slips on the edge of burner section or the shell of combustion chamber	Bend the ignition plug or shell of combustion chamber allowing a spark to slip on the aperture area of the nozzles of burner section
	Burner block is contaminated	Clean burner block (see p.16.1.1, page 32)
Smell of gas	Gas leakage	Check all the gas line on air-tightness (see p.8.2, page13), Remove gas leakage
Little hot water output or its absence	Lack of inlet DHW water pressure	Address to the Housing and Public utilities service
	Water filter is contaminated	Clean the filter on DHW line
	Heat exchanger is contaminated	Clean heat exchanger (see p.16.1.3, page 33)
Set hot water temperature is not maintained (too high)	High temperature of inlet water	Increase water flow through DHW or mix how water with cold and don't let flow reduce through DHW
	Little water flow through DHW line	Increase water flow through DHW
Boiler doesn't work in CH mode (but works in DHW)	Jumper of the room thermostat is absent	Install a jumper of the room thermostat
	Room thermostat's jumper connecting pins 28 and 29 is failed (cm. Annex III, page 53)	Replace a jumper of a room thermostat
	Failure of room thermostat (if it is installed)	Replace a room thermostat
Inlet water temperature in the heating system is lower than the set one	Failure of CH temperature sensor	Clean temperature sensor from scale (if dip temperature sensor is used)
		Replace temperature sensor

Failure	Reason of failure	Troubleshooting
Boiler is in stand-by mode, a symbol«- -» is displayed but boiler doesn't react to the pressed control buttons	Power voltage is over 190 ÷ 250 V	Restore power voltage in range 190 ÷ 250 V. Within 30 seconds will be automatic boiler's start up in the previous mode that boiler used to be before the power voltage went over the range 190 ÷ 250 V

15. HANDING THE BOILER OVER TO THE CUSTOMER

After mounting a boiler, a specialist of the service department is obliged to check boiler's operating at minimal and maximal power in all modes (see section 11, page 22). **Gas supply regulator should be obligatory adjusted (see section 11).**

After completion of installation and adjustment works, user should be instructed about boiler's treatment:

- ✓ Safety precautions when applying the boiler;
- ✓ Procedure of switching on/off a boiler;
- ✓ Management of a boiler;
- ✓ Treatment of a boiler performed by the user.

In the section 22 (page 41) of present user's manual should be indicated the instruction conduction. There should also be a mark about boiler mounting.

16. TECHNICAL SERVICE AND OPERATION CHECK

Technical service and operation check should be performed by a special service organization.

Caution! Activities related to the technical service don't go under the warranty of company- manufacturer and paid by the consumers.

During annual technical service it is necessary to carry out the following:

- 1) Cleaning of the burner block (burner) including wiping of ignition and ionization plugs (see p. 16.1.1);
- 2) Cleaning of the heat exchanger from soot and cleaning (wiping) of tubes of heat exchanger from scale (if necessary) (see p.16.1.2; p. 16.1.3, page 33);
- 3) Replace seals in gas and water systems (in such connections where disassemble of water and gas pipes or in the places where water or gas leakage occur);
- 4) Check air-tightness of boiler's water and gas systems;
- 5) Lubricate moving connections (if necessary), dense based on silicon lubricants are recommended;
- 6) Check operation of safety devices and sensors(see p.16.2.2, page. 34);
- 7) Check air pressure in the extension tank (once per 3 years);
- 8) Check air duct system and removal of combustion products on leakage;
- 9) Check water flow in DHW (should be enough for switching DHW mode on);
- 10) Check the heating system on contamination.

Caution! Operations related to technical maintenance of the boiler, disassemble of its gas and water pipes, are necessary to perform only when the boiler is completely switched off (taps on boiler's inlet water and gas lines should be closed, boiler should be disconnected from the power).

16.1. Technical service

16.1.1 Cleaning the burner block

Caution! Keeping burner block in pure conditions will protect heat exchanger from the soot and increase its service live.

To clean the burner block 5 (p.13.1, page24) it is necessary:

- 1) To dismount a burner (see p.17.1, page 36);
- 2) Remove dust by the brush from the external burner's surfaces and manifold;
- 3) Remove carbon deposit with the sandpaper from the ignition and ionization electrodes;
- 4) Wipe with wet rag manifold and nozzles;
- 5) Remove dust with a brush-cleaner out of inner channels of the burner blade;
- 6) Wash a burner in soup water, particularly spaces of its sections by means of the brush-cleaner, thoroughly wash it in running water, dry and then put it back;
- 7) Check joints on leak-proof subject to disassembling (see p.16.2.1, page 33);
- 8) Check if ignition plug is on the distance $5^{+0,5}$ mm above the burner blade;
- 9) Check if ionization plug is on the distance $3^{+0,5}$ mm above the burner blade.

It is necessary to check whether burner's sections and nozzles are not damaged.

External cleaning of heat exchanger

In order to improve gas combustion and to achieve maximum heat exchange in the appliance, it is necessary to keep finning of the heat exchanger 4 (p.13.1, page 24) in order. If heat exchanger is contaminated, it is necessary to clean its surfaces where soot has appeared.

Before disassembling it is necessary:

- 1) Switch the boiler off;
- 2) Close CH inlet and output taps;
- 3) Cover pump and other electrical (electronic) appliances with the foil against water entry;
- 4) Drain the boiler.

To remove the soot it is necessary:

- 1) To disassembly the heat exchanger (see p. 17.2, page 37) and put it into soap solution or any other synthetic detergent;
- 2) Keep it in the soap solution for 10-15 minutes and clean the top and low surfaces by means of the soft brush, then wash under strong current of water;
- 3) Repeat above mentioned process again if necessary;
- 4) Maintain heat exchanger with the new gaskets, rubber gaskets should be lubricated with the silicon oil;
- 5) Check the joints of gas and water subject to disassembling on leakage (see p.16.2.1, page33).

16.1.2 Internal cleaning (washing) of heat exchanger

While applying heat exchange there is a chance of scale appearance on heat exchanger's 4 (see p.13.1, page24) inner surfaces.

To remove scale it is necessary:

- 1) Demount the heat exchanger (see p.17.2, page37) and put it into a container;
- 2) prepare 10% solution of citric acid (100 g of powdered citric acid for 1 liter of warm water);
- 3) Fill this solution into heat exchanger's tube;
- 4) Keep this solution there for 10-15 minutes, then drain it and wash heat exchanger's tube (coil) thoroughly with water and if necessary to repeat all the procedure;
- 5) Mount the heat exchanger with new gaskets;
- 6) Check the joints of gas and water subject to disassembling on leakage (see p..16.2.1 , page 33).

Also it is necessary to clean DHW filter. It is located in the DHW flow sensor and can be demounted by means of corkscrew or any other instrument.

16.2 Boiler's operation check

At every boiler's service it is necessary to check:

- 1) Constant voltage regulator presence;
- 2) Voltage and frequency of inlet current in the boiler in accordance with indicated technical requirements on the data plate (see p.2.2, page5);
- 3) Whether NG is supplied with the rated pressure 1,3-2,0 kPa (130-200 mm of water column) or LPG with the rated pressure 2,9 kPa (300 mm of water column). To measure pressure is necessary while the boiler is on.

Before to check gas and water tract on leakage, or any other safety device, it is necessary to put a casing and sealing cap off from the boiler (see p.17.1, page 36).

16.2.1 Checking gas and water systems leak resistance

Note! Checking leak-resistance of gas joints is performed by soup solution bubble test (or any other safe methods without using open flame sources). Appearance of bubbles means gas leakage.

Check on leakage is performed in such joints as: gas supply regulator with gas supply pipe, gas pipe with burner block and gas supply regulator, and also in the control points A and B of gas supply regulator (see p.11, page 22).

Checking water system on leakage is performed alternatively in CH and DHW modes. The following joins are checked: boiler with the heating system and DHW, heat exchanger with the hydraulic group, tightness of hydraulic group elements. Leakage in the joints is not allowed.

In case of gas or water leakage it is necessary to remove it by tightening the nuts (gauges) or installing a new sealing.

16.2.2 Checking of safety device operation

16.2.2.1 Checking of water sensor in heating system

Before switching the boiler on, put the cables off from the water pressure sensor 25 (see p.13.1, page 24). During the start up, boiler will display a symbol "04", signaling about the emergency in CH.

After eliminating the reasons of boiler's emergent switching off (installing cables of the pressure sensor back), boiler should automatically switch on.

16.2.2.2 Checking of water overheating protection in the heating system

From the operating boiler to put the cables off from the thermo relay 9 (see p.13.1, page 24). Boiler should switch off and display a symbol "02". After eliminating the reasons of the emergent switching off (connecting cables to the thermo relay back) and pressing a button K6 (RESET), boiler should automatically switch on.

16.2.2.3 Checking of bypass valve operation

When the boiler is working in the heating mode (see p.3.2.4, page 9) it is necessary to shut off a stop valve on the heating system inlet. Bypass valve 12 (see p.13.1, page 24) should direct water bypass from the heating system through the bypass pipe. After checking it is necessary to open a stop valve on the heating system inlet.

16.2.2.4 Checking of safety valve operation

Checking of safety valve operation 17 (see p.13.1, page 24) implies turning the knob on the valve to the left (counterclockwise) in order to let water ejection out of the valve. The valve should close by itself.

16.2.2.5 Air removal valve checking

If a cap of the air removal valve 20 (see p.13.1, page 24) is open, there shouldn't be water leakage. Via the valve only air should be removed.

16.2.2.6 Checking of gas supply regulator operation

Set water temperature in the heating system 50 °C. During the boiler's operating it is necessary to look after temperature values on the display and also gas pressure value in the burner (see section 11, page 22). When displayed temperature will be higher for ~ 1-2 °C than a set one, gas supply regulator 8 (see p.13.1, page 24) should reduce gas pressure in the burner (flame height will decrease).

Before switch the boiler on, disconnect one of the cables of the modulator coil of gas supply regulator. An emergency code "07" will blink on the display, which signals about regulator's refusal to operate. After eliminating the reason of boiler's emergent switching off (connect cable to the regulator back), the boiler will switch on automatically.

16.2.2.7 Ionization plug checking

From the operating boiler to put a cable off from the ionization plug 11 (see p.13.1, page 24). Boiler should switch off and display a symbol "01". After eliminating the reason of boiler's emergent switching off (connect cable to the ionization plug back) and pressing a button K6 (RESET), boiler will switch on automatically.

Flame detection is based on the principle of monitoring ionization current. Ionization current is measured by micro ammeter, consequently connecting it to the circuit of ionization current. Optimal value of the ionization current is 3...5 µA.

Reasons of reduced ionization current can be the following: «current leakage», low connection with the "ground" or wrong plugs connection. In this case it is necessary to replace cables of ionization and ignition plugs with each other. Sometimes low ionization current can be caused by inappropriate requirement of gas-air mixture or appearance of carbon deposit on the ionization plug while using a boiler.

16.2.2.8 Checking of control devices for combustion products removal

Switch the boiler on, preliminary disconnect an exhaust flue from the boiler. Cover a hub, mounted on the fan's pipe with a metal sheet. Boiler should switch off and display a symbol "03" which signals that boiler stops operating because of the draught lack in the exhaust flue.

After eliminating the reason of boiler's emergent switching off, and also realizing the blockage by means of the button K6 (RESET), boiler should automatically switch on. After performing such checking, it is necessary to mount the exhaust flue back ensuring the joint air-tightness.

16.2.2.9 Checking of CH temperature sensor

Before switching the boiler on, disconnect the cables from the CH temperature sensor 10 (see p.13.1, page 24). When trying to start up the boiler in CH mode, it should display a symbol "05" which signals about the refusal of CH temperature sensor to operate.

After eliminating the reason of boiler's emergent switching off (connecting cables to the sensor back) boiler should automatically switch on.

To check the temperature sensor, measure its resistance: $R=10\text{ k}\Omega$ (at 25 °C).

16.2.2.10 Checking of DHW temperature sensor

Before switching the boiler on, disconnect the cables from the DHW temperature sensor 14 (see p.13.1, page 24). When trying to start up the boiler in DHW mode, it should display a symbol "06" which signals about refusal of the DHW temperature sensor to operate.

After eliminating the reason of boiler's emergent switching off (connecting cables to the sensor back) boiler should automatically switch on.

To check the temperature sensor, measure its resistance: $R=10\text{ k}\Omega$ (at 25 °C).

16.2.2.11 Checking DHW flow sensor

Render boiler into DHW mode (see p.3.2.2, page 8), open a tap in DHW line. Put the cables off from the DHW flow sensor 15 (see p.13.1, page 24). Boiler should enter into the stand-by mode.

After connecting the cables back, boiler should automatically switch on.

16.2.3 Checking of air pressure in the expansion tank

Demount an expansion tank (see p. 17.5, page 38), without putting it off from the boiler. Through the valve (nipple), located in the upper part of the tank, measure air pressure. Pressure should be $(0,1 \pm 0,02)$ MPa. If the pressure in the expansion tank is lower than the allowed one, it is necessary to increase it up to the required value by the pump or any other safe device. If the inner membrane is damaged (when measuring the air pressure, there is water in the valve or air pressure doesn't restore), it is necessary to replace the expansion tank.

16.2.4 Checking of the air inlet and combustion products output systems on leak resistance

Visually check exhaust flue integrity. Sags and gaps in the joints of the exhaust flue elements are not allowed. Joints of the separate exhaust flues which elements do not consist of presence of O-Rings, should be sealed with aluminum heat-resistant tape or any other material with similar properties.

16.2.5 Checking of DHW water consumption

Determine maximum water flow in DHW line with a draw down gauge. Water consumption should be at least 2,5 l/min. If water flow is less than 2,5 l/min, it is necessary to clean the boiler's inlet water filter in DHW line (if filter is mounted).

16.2.6 Checking of heating system's with respect to its stoppage

When boiler is operating in CH (see p.3.2.4, page 9) it is necessary to check whether a bypass pipe heats. If bypass pipe is heated constantly, it is necessary to clean a boiler's inlet water filter in CH line (if filter is mounted), and also in other heating areas where contamination is possible. Before cleaning a filter, it is necessary to Switch the boiler off and drain the water out of the boiler (see p. 10.4 and 10.5, page 21) (if there are no shut off valves, to drain the water out of all heating systems).

17 BOILER'S DISASSEMBLING AND DISMANTLING OF MAIN UNITS

Boiler's disassembling and all dismantling activities of the main units are performed only **when the boiler is off, electricity power, gas and water supply are off**. For any work concerning dismantling, it is necessary to drain the water out of the boiler (see p. 10.5, page 21).

17.1 Burner block dismantling

To disassemble a burner and manifold which are concerned to be the parts of the burner block it is necessary:

- 1) Switch the boiler off (see p. 10.4, page 21);
- 2) Unscrew 4 self-threading screws of casing fastening to the boiler's lowest panel;
- 3) Remove the cap of front panel;
- 4) Unscrew two self-threading screws 1 and four self-threading screws 2 (see scheme.13) of fastening to the front panel to the casing;



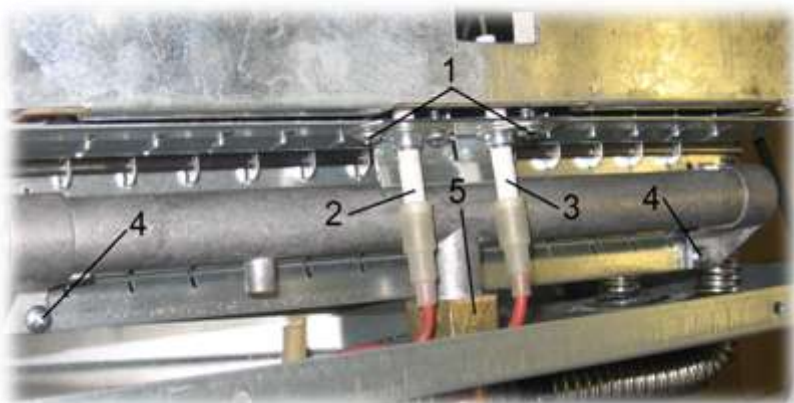
Scheme 13. Casing dismantling to the front panel

- 5) Throw a front panel with a cap down;
- 6) Put a casing off pulling it up over yourself;
- 7) Unscrew 4 self-threading screws sealing cap's fastening
- 8) Put a cap off pulling it hard up over your self. When assembling take into consideration proper installation of the cap's sidewalls which should enter slots on the back side of the boiler.

Caution! Ground cables are fixed under left low self-threading screw of the sealing cap's fastening. When assembling ground cables, they should be mounted on their places and tightly fixed by the self-threading screws.

- 9) Unscrew 2 self-threading screws 1 (see scheme 14) of plate's fastening with the plugs and put a plate off;

- 10) Unscrew 2 screws 4 (see scheme.14) of manifold's fastening to the burner front bracket;
- 11) By means of a turnkey 30 unscrew a nut 5 of the fastening of manifold to the gas pipe and put a manifold off;



Scheme14. Manifold dismantling



Scheme15. Burner dismantling

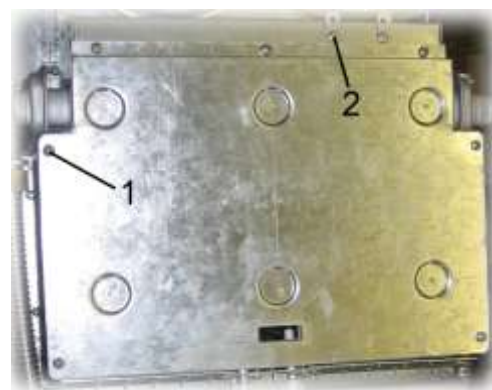
- 12) Unscrew four self-threading screws 3 (see scheme.15) of the fastening of burner to the back wall of the boiler (2 from each side) and put a burner off.

Assembly is performed in the reverse order.

Heat exchanger dismantling

To dismount a heat exchanger it is necessary:

- 1) Switch the boiler off (see p.10.4, page.21);
- 2) Block the boiler's inlet stop valves on pipes of heating systems, drain the water out of the boiler (see p. 10.5, page21) (if there are not stop valves, drain the water out of the whole heating system);
- 3) Put a burner block off (see section17.1, page36);
- 4) disconnect cables from the thermo relay 4 (see scheme.15);
- 5) By means of the turnkey 30 to unscrew 2 nuts 1 of pipes fastening to the heat exchanger;
- 6) Unscrew two self-threading screws 2 from each side of heat exchanger's fastening to the back sidec ;
- 7) Unscrew seven self-threading screws 1 (see scheme.16) of the exhaust flue bar's fastening 2 and put a bar off;
- 8) Remove heat exchanger by pulling it up.



Scheme16. Heat exchanger dismantling

Assembly is performed in the reverse order.

17.2 Pump dismantling

To dismount a pump it is necessary:

- 1) switch the boiler off(see section 10.4, page 21);
- 2) block inlet and output stop valve in the boiler, drain the water out of the boiler (see section 10.5, page21) (if there are not stop valves, drain the water out of the whole heating system);
- 3) put a casing and cap off from the boiler (see p.17.1, page 36);
- 4) by means of the turnkey 30 to unscrew two nuts 1 (see scheme.15) and put the pipes aside;



Scheme 17. Pump dismantling

- 5) unscrew on the low panel three screws of the pump's fastening 1 and two screws 2 of bithermic manifold fastening;
- 6) disconnect a screw termination 3 (see scheme. 17) with the pump's power cables out of the connector;
- 7) put off a bracket 4 of pipe's fastening from the pump's pipe and put a pipe up;
- 8) disconnect a fitting of manometer 6, by pulling a bracket of fitting's fastening 5 out of the pump's body;
- 9) disconnect cables from the pressure sensor 7;
- 10) put off a bracket 8 of CH output fastening and put it aside;
- 11) unscrew screws 9 of bithermic manifold fastening 10 to the pump;
- 12) dismount a bithermic manifold;
- 13) Take out a pump by pulling it hard to the right and up.

Assembly is performed in the reverse order.

17.3 Bypass valve dismantling

To dismount a bypass valve it is necessary:

- 1) switch the boiler off(see p.10.4, page 21);
- 2) block inlet and output stop valve in the boiler, drain the water out of the boiler (see section 10.5, page 21) (if there are not stop valves, drain the water out of the whole heating system);
- 3) put a casing off from the boiler (see p.17.1, page 36);
- 4) put off a bracket 1 of CH output pipe's fastening (see scheme.);
- 5) take a pipe 2 out of the bithermic manifold 3;
- 6) take out a bypass valve (see Annex I, page 45);
- 7) a faulty bypass valve to replace.



Scheme 18 bypass valve dismantling

Assembly is performed in the reverse order.

17.4 Expansion tank dismantling

To dismount an expansion tank it is necessary:

- 1) switch the boiler off(see p.10.4, page 21);
- 2) block inlet and output stop valve in the boiler, drain the water out of the boiler (see section 10.5, page 21) (if there are not stop valves, drain the water out of the whole heating system);



Scheme 19. Dismantling of the tube of expansion tank



Scheme 20. expansion tank dismantling

- 3) by means of the turnkey 22 to unscrew a nut 1 (see scheme. 19) of the pipe of the expansion tank 4;
- 4) by means of the turnkey 22 to unscrew two fastenings of the expansion tank 4 to the bracket 3;
- 5) unscrew two screws of the fastening 5 (see scheme. 20) of the upper bracket 6 to the boiler's channel bars;
- 6) put off an upper bearing 6 and take out a tank out of the channel bars by pulling it up.

Assembly is performed in the reverse order.

18 UTILIZATION

Upon completion of using the boiler, it is necessary to dismantle it by the following operations:

- 1) Disconnect the boiler from the main power;
- 2) block stop valves on the pipes of heating system, drain water out of the boiler (if there are not stop valves, drain water out of the whole heating system);
- 3) shut a gas block valve;
- 4) disconnect pipe connection from the CH, DHW and gas;
- 5) take a boiler off from the wall.

It is essential to remember that the boiler is considered to be a potentially traumatic object! Therefore when utilizing the boiler, it is necessary to ensure maximum safety for others.

Boiler and its package consist of materials suitable for recycling. Dismounted boiler is recommended to hand over to a specialized organization.

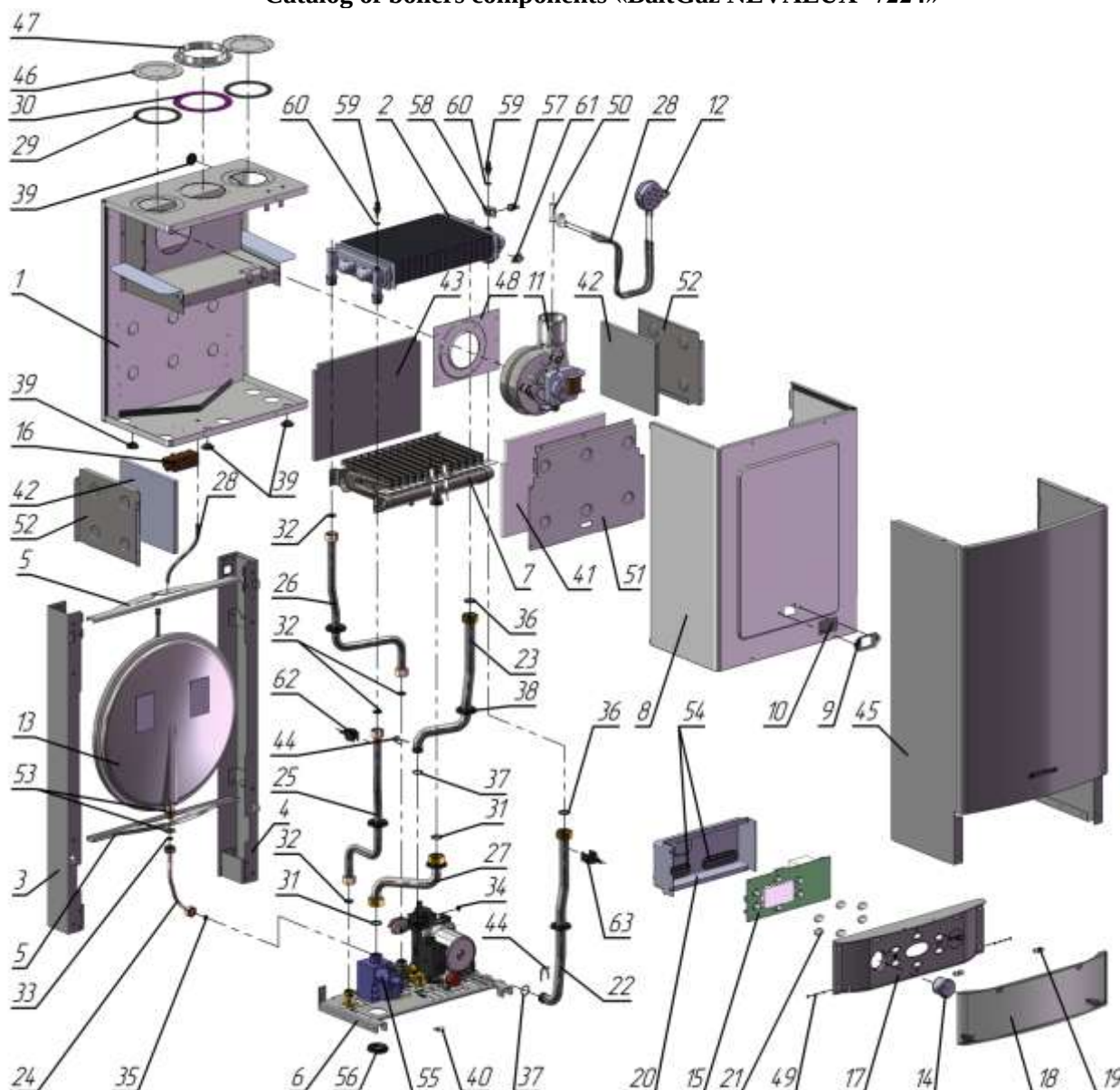
19 DELIVERY SET

Table 6

1. Wall-hung boiler: «BaltGaz NEVALUX-7224»	1 pcs.
2. User's manual 7224-00.000-01RE	1 exmp.
3. Bracket of boiler's fastening 8223-20.011	1 pcs.
4. dowel NAT 10	2 pcs.
5. screw 6,3x50 mm	2 pcs.
6. spacer 8023-00.003	3 pcs.
7. spacer 3103-00.014	2 pcs.
8. Aluminum adhesive foil, width 50 mm	0,8 m
9. package	1 pcs.
10. gasket Ø125 mm (8223-01.007)	1 pcs.
11. harness board 7324-20.009	1 pcs.

Annex I

Catalog of boilers components «BaltGaz NEVALUX-7224»

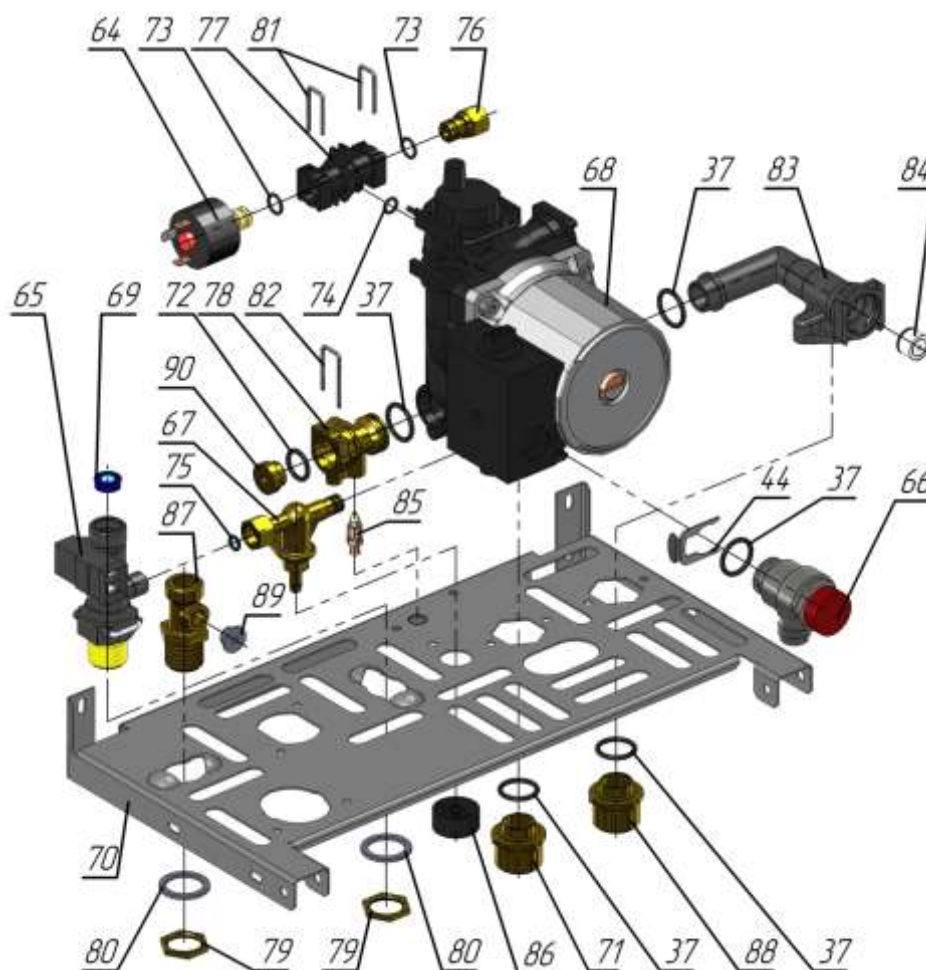


Pos.	Designation	Note
1	Back wall in assembly	Consists of: 1) Back side 7224-01.051 2) Exhaust flue 8223-01.200 3) damper 8223-01.002 4) bar 8230-01.005 5) bearing 8223-00.014 6) bearing 8223-00.015
2	Heat exchanger 256350881801	Applied together with a clamp 0409001010 (pos. 58), thermo relay HD8.5FC-9 (Pos. 57), temperature sensor TP01AH1LQ (pos. 59) and copper spacers 8223-02.003 (pos. 60)
	Heat exchanger QF/DSGLS-L270	Applied together with thermo relay TY60/A B230AG-90°C (pos. 61), temperature sensor JXW-54 (14) (pos. 62) and temperature sensor JXW-54 (18) (pos. 63)
3	Channel bar 8223-01.110	
4	Channel bar 8223-01.110-01	
5	Bearing 8023-01.002	
6	Hydraulic group 10037608006050	
7	Burner block 7224-22.000	13 blades, nozzles Ø 1,31 mm (NG (G20, 2 family, group H) 1,3 kPa)

Pos.	Designation	Note
	Burner block 7224-22.000-01	13 blades, nozzles Ø 0,79 mm (LPG (G30,3 family, group B/P), 2,9 kPa)
8	cap 8223-10.001	
9	bearing 8223-10.002	
10	Viewing window 8223-10.005	
11	fan ERR97/34L	
12	Air pressure switch NS2-1245-00	
	Air pressure switch RB21001	
13	Expansion tank 13C0000619	6 L
14	manometer 066206	4 bar
15	Electronic board MIAD300	
16	igniter AC03ABK5JQ	
17	panel 8223-15.001	White color
	panel 8223-15.001-02	White-grey color
18	cap 8324-15.100	
19	Magnet in assembly 8223-15.200	
20	housing 8223-15.002	
21	button 8223-15.003	
22	Output CH pipe 7324-05.000	
23	Inlet CH pipe 7324-06.000	
24	Tank's pipe 7324-07.000	
25	Output DHW pipe 7324-08.000	
26	Inlet DHW pipe 7324-09.000	
27	pipe 7324-11.000	
28	pipe 8223-00.003	5,0x1,5; L=360 mm
29	spacer 8223-01.004	
30	spacer 8223-01.007	
31	spacer 8023-00.003	G3/4
32	spacer 3103-00.014	G1/2
33	spacer 8023-00.004	G3/8
34	spacer 8023-00.005	G1/4
35	spacer 8023-00.005-01	G1/4
36	spacer 8223-00.013	G3/4
37	O-Ring OR 17,86x2,62 21000606701200	
38	Cuff 8023-06.002	
39	hub 8023-00.007	
40	housing 8223-00.006	
	housing CCUC-1	
41	thermo insulation 8230-00.002	
42	thermo insulation 8230-01.003	
43	thermo insulation 8230-01.004	
44	pin 18 21000607000600	
45	Casing in assembly 8223-12.000	
46	Gauge 8223-01.003	
47	flange 8223-01.006	
48	Plate 8223-16.001	
49	axle 8223-15.004	
50	pipe Venturi PP270	
51	Wall 8230-00.001	
52	Side wall 8230-01.002	
53	nut 8023-01.004	G3/8
54	cuff 8223-15.005	
55	Gas supply regulator EBR2008N	

Pos.	Designation	Note	
56	Decorative panel 8023-02.002		
57	Thermo relay HD8.5FC-9	90 °C	Applied only together with heat exchanger 256350881801
58	clamp 0409001010		
59	Temperature sensor TP01AH1LQ		
60	Copper sensor 8223-02.003		
61	Thermo relay TY60/A B230AG-90°C	90 °C,	Applied only together with heat exchanger QF/DSGLS-L270
62	Temperature sensor JXW-54 (14)	Ø 14 MM	
63	Temperature sensor JXW-54 (18)	Ø 18 MM	

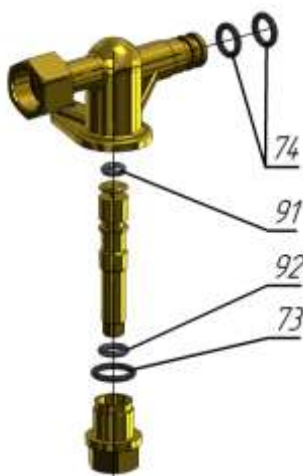
Components of hydraulic group pos. 6



Pos.	Designation	Note
64	Pressure sensor 21000605300200	0,5 bar
65	DHW flow sensor 21000605000800	
66	Safety valve 21000607200600	3 bar
67	Infeed unit 500.110 30029607800400	OTMA
68	Pump OTSL 15/5/3 CRR9 21000606506910	83 W, 2200 turns/min
69	DHW flow restrictor 21000607300400	10 L/min
70	Low panel 7324-02.001 (21000608010200)	
71	Pump's fitting 21000605800200	
72	O-Ring OR 13,95x2,62 21000606700700	

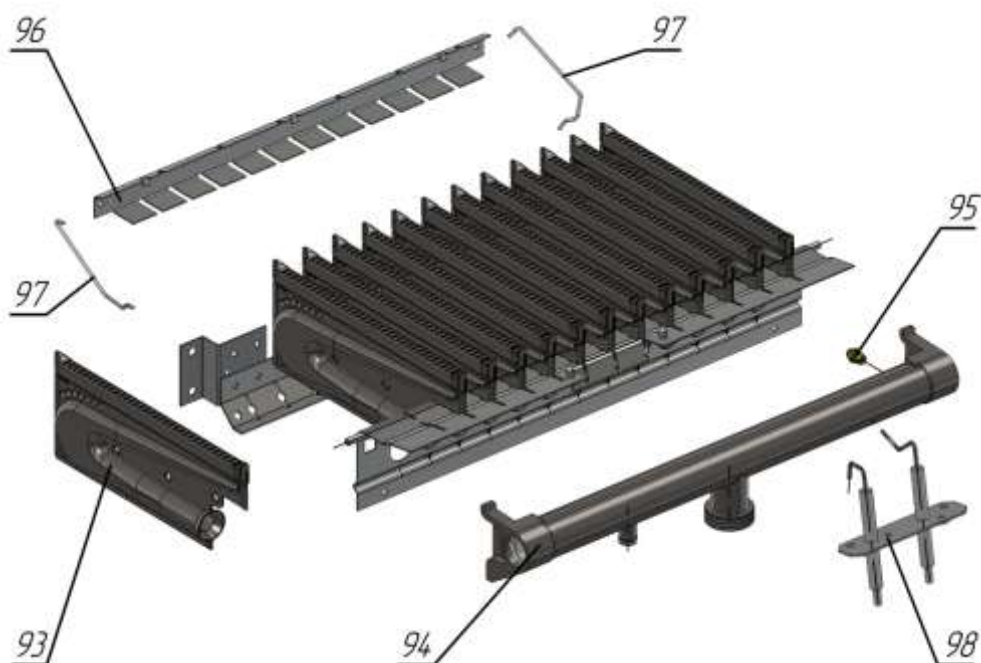
Pos.	Designation	Note
73	O-Ring OR 9,25x1,78 21000606701000	
74	O-Ring OR 6,75x1,78 21000606700500	
75	O-Ring OR 5,5x2 21000606701700	
76	Manometer's connector 21000605800300	
77	separator 21000605700400	
78	Pump's fitting 21000607603700	
79	nut G1/2 00046240210080	G1/2
80	spacer 21x28x2 21000607900800	
81	bracket 8 21000607000300	
82	bracket 14 21000607000200	
83	Bithermic manifold 21000607700900	
84	Bypass valve HDS 15-300 21000607300500	
85	Draining fitting 21000606000300	
86	knob 00046240505010	
87	fitting G1/2 21000607602700	
88	fitting 21000607603800	
89	gauge 21000607608800	
90	gauge 21000607609300	

Components of the infeed unit pos. 67



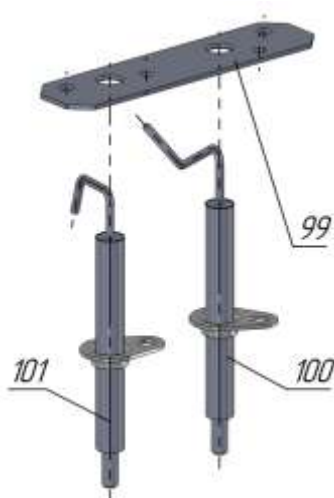
Pos.	Designation	Note
91	O-Ring OR 1,8x2,65 21000606700100	
92	O-Ring OR 5,28x1,78 21000606400100	

Components of the burner block pos. 7



Pos.	Designation	Note
93	Burner blade 3295.07.40.000	
94	Manifold in assembly 3295.07.20.000-10	nozzles Ø 1,31 mm (NG (G20, 2 family, group H), 1,3 kPa)
	Manifold in assembly 3295.07.20.000-11	nozzles Ø 0,79 mm (LPG (G30, 3 family, group B/P), 2,9 kPa)
95	nozzle 3295.07.20.005-19	Ø 1,31 mm (NG (G20, 2 family, group H), 1,3 kPa)
	nozzle 3295.07.20.005-20	Ø 0,79 mm (LPG (G30, 3 family, group B/P), 2,9 kPa)
96	bar 8223-22.003	
97	bracket 8223-22.006	
98	Plugs in assembly 8223-22.060	

Compound elements of the plugs in assembly pos. 98



Pos.	Designation	Note
99	plate 8223-22.061	
100	Ionization plug ELB21001	
101	Ignition plug ELB21002	

Components of wiring

Designation	Note
Power cable CBAB0W008	220B, 50Hz
Main cable CBAB0096	To connect a fan, gas supply regulator, igniter
Pump cable CBAB0W020	To connect a pump
Gas supply regulator cable CBAB0W009	To connect modulator coil of gas supply regulator, DHW flow sensor, pressure sensor
CH temperature sensor cable CBAB0W010	To connect CH temperature sensor
DHW temperature sensor cable CBAB0W026	To connect DHW temperature sensor
Air pressure switch cable CBAB0W014	To connect air pressure switch and thermo relay
Ignition plug cable CBAB0W006	To connect ignition plug
Ionization plug cable CBAB0W012	To connect ionization plug
Ground cable CBAB0W013	Ground connection
Room thermostat connector CBAB0W023	Room thermostat connector (option)
Connecting cable PEC3	To connect safety valves and gas supply regulator

Annex II

Guidance to select an expansion membrane tank

If to connect a boiler to the heating system with a volume more 70 liters, it is necessary to install an additional expansion membrane tank, by connecting it to the return line ("by-pass") really close to the boiler.

In the tables presented below, you can find water volume necessary for fulfilling elements of the heating system. Volume of the boiler by itself is 2 liters. This data allows to make an approximate calculation of the water quantity in the heating system to which boiler will be connected.

Tables to calculate volumes of water:

Copper pipes	
Pipe diameter, mm	Water quantity, dm ³ /M.П.
10x0,8	0,05
12x1,0	0,08
15x1,0	0,13
18x1,0	0,20
22x1,2	0,30
28x1,2	0,52
35x1,5	0,80
42x1,2	1,20

Steel pipes	
Pipe diameter, mm	Water quantity, dm ³ /M.П.
G3/8	0,13
G1/2	0,21
G3/4	0,38
G1	0,60
G11/4	1,02
G11/2	1,39
G2	2,21
G21/2	3,72
G3	5,13
G4	8,71

Water volumes in the radiators		
Type of radiator	power, W	Volume, dm ³
iron:	For 1 fin	
500/160	130	1,01
TA-1	150	1,34
T-1	125	1,18
steel:	For radiator	
11-400/960	915	2,78
11-600/960	1282	4,15
22-600/960	2225	8,30
11-600/1000	1310	2,97
22-600/1000	2225	5,93
11-600/900	1179	3,10
22-600/900	1984	6,30
11-590/960	1091	3,20
22-590/960	1908	6,50
Power is indicated for the parameters 90/70/20 °C, where: 90 – temperature in direct heating line; 70 – temperature in reverse heating line; 20 – temperature in the area.		

Another way to determine water volume in the heating system is to compare values of the water sensor before and after filling with water.

Minimal initial pressure in the expansion tank should not be less than the static pressure at the connection point of the vessel.

Static pressure- is a pressure of the water column between the expansion vessel and the highest point of the heating system. Measuring this height in meters, we calculate static pressure taking 0,001 MPa of overpressure for each height of meter. Initial pressure in the expansion tank should be approximately 10% more than calculated static pressure/

For instance: Measured height is 8 meters, which corresponds to the value of the static value 0,08 MPa. Initial pressure in the expansion vessel should be approximately $(8 \times 0,01) \times 1,1 = 0,09$ MPa. To sum I up, calculated pressure is considered as initial one in the heating system with cold water.

Membrane expansion vessels have nipple apertures which serve for regulating and monitoring of pressure's values in the gas part of the vessel. After you define the initial pressure, it is necessary to measure pressure in the gas part of the vessel (for instance; by the car gauge) and then release or add (for instance; by the car gauge) the air up to the set pressure value. Simultaneously you should consider that for the boilers BaltGaz NEVALUX the initial pressure in the expansion tank should be at least 0,1 MPa and not more than 0,3 MPa.

Lower pressure can cause the boiler's operating failure.

To calculate the full volume of the expansion vessel you can use the following formula:

$$V_c = 1,099 \cdot V_i \cdot A_v \cdot (P_{\max} + 0,1) / (P_{\max} - P),$$

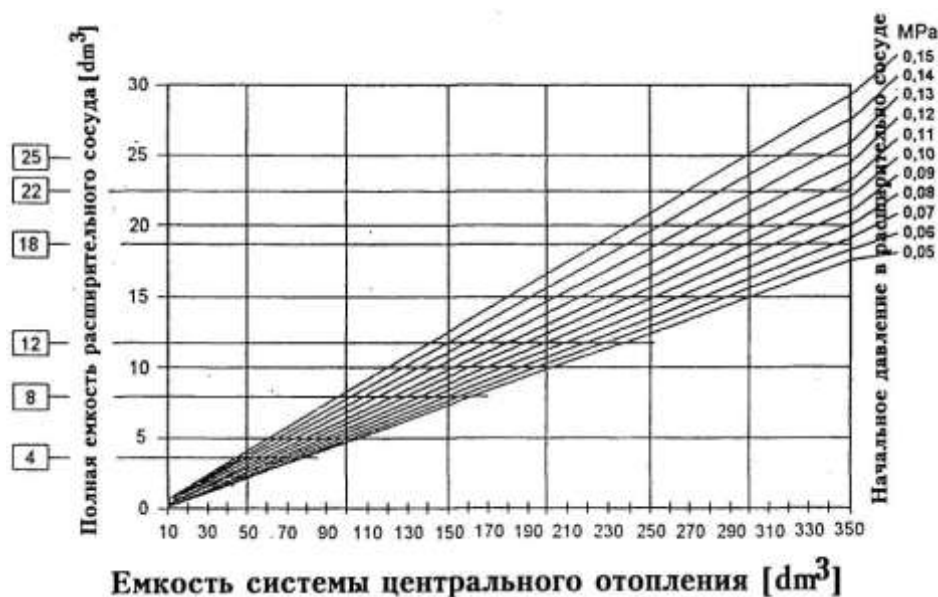
where:

V_i – full volume of heating system dm^3 ;

A_v – growth of water volume in the heating system from the heating up to the maximal possible temperature;

$P_{\max} = 0,3$ MPa – maximal calculated pressure in the expansion tank (equals to the pressure of the safety relief valve);

P – initial pressure in the expansion tank начальное давление в расширительном баке (calculated according the mentioned above method).



Central heating system capacity, [dm³]

Expansion tank full capacity, [dm³]

Starting pressure in the expansion tank

In case, volume of the tank is between tyschemeal values, when choose, follow by the rule "first is larger".

In the boiler is installed a vessel with a volume 6 dm^3 .

If after calculating it will turn out that for such heating system it is necessary to have an extension tank of bigger volume, it is necessary to install an additional extension tank, where its value will be equal to the difference between calculated value and volume of the boiler's extension tank (6 dm^3).

For instance: according to the calculation, the heating system requires to install an expansion tank with a volume 6 dm^3 , i.e. $13 - 6 = 7$ dm^3 . Consequently, it is necessary to install additionally a vessel with a volume 7 dm^3 . On the monograph you should choose the next bigger standard expansion tank with a volume 8 dm^3 .

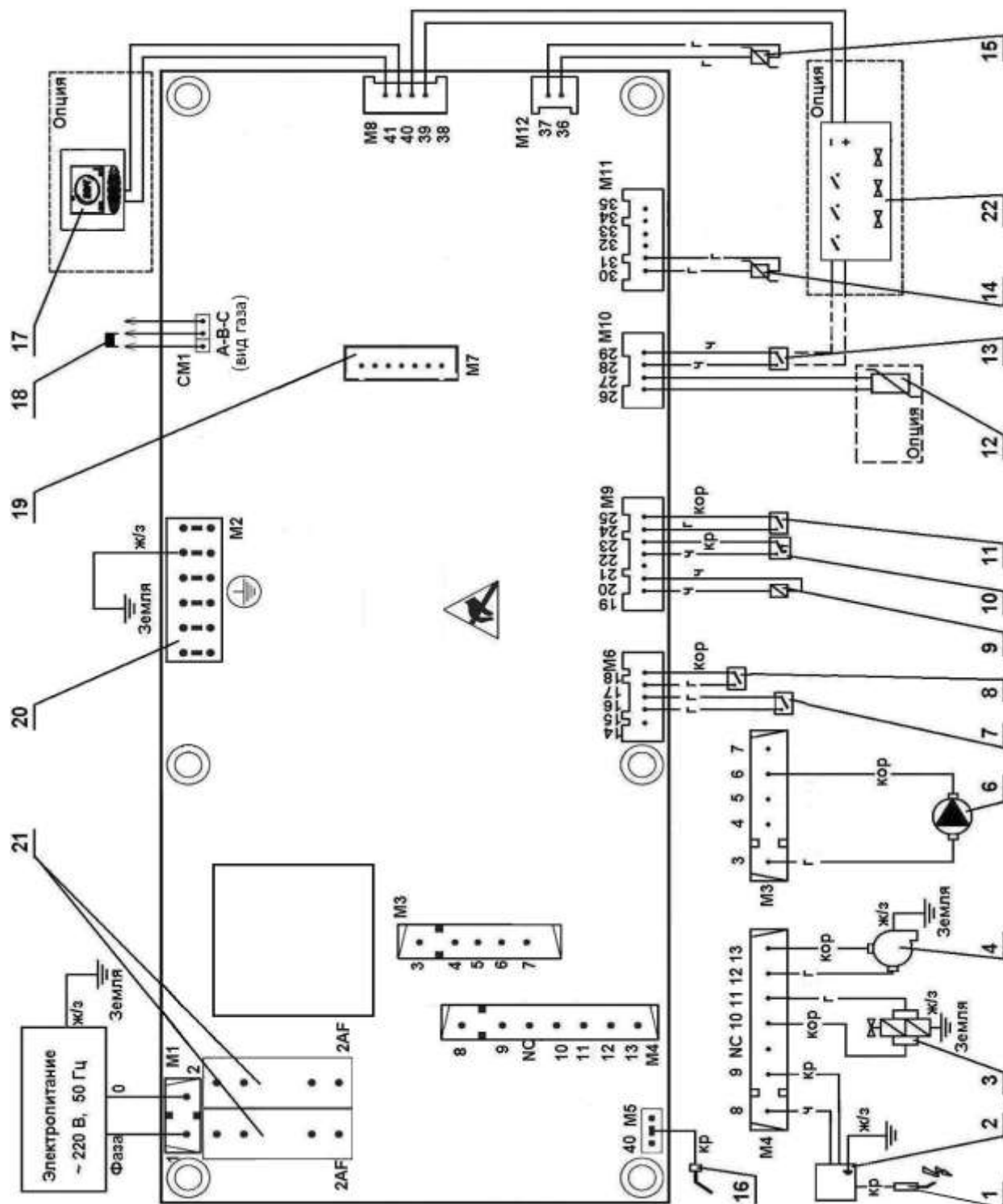
Annex III

- 1 - Ignition plug;
- 2 - igniter;
- 3 - gas supply regulator;
- 4 - fan;
- 6 - pump;
- 7 - air pressure switch;
- 8 - thermo relay 95 °C;
- 9 - modulator coil of gas supply regulator;
- 10 -pressure sensor;
- 11 -flow sensor ГBC;
- 12 -temperature sensor outdoor (option);
- 13 -room thermostat (option)*;
- 14 -CH temperature sensor;
- 15 -DHW temperature sensor;
- 16 -Ionization plug;
- 17 -Remote control (option).
- 18 -jumper (choosing gas type)**;
- 19 -connector of mounting a PC for boiler operating diagnostics ;
- 20 -ground socket;
- 21 -fuse (2 pcs for 2 A);
- 22 -Zone controlling zone (option).

* If a room thermostat 13 is not present, close pins of connector M10, intended for its connecting

** While adjusting boiler on LPG, close by means of jumper 18 pins BC of connector CM1, while adjusting on NG close by a jumper pins AB (see wiring instruction).

Boilers wiring
diagram «BaltGaz
NEVALUX-7224»



Cables colors designation:

бел – white; г – blue; ж/з – yellow-green; кор – brown; кр – red; ор – orange; ч – black.

	Connector	Pins	Cables colour	Cable	Parameters
Power supply	M1	1	brown	Power cable	220 V, ~ 50 Hz
		2	blue		
Fan	M4	12	blue	Main cable	220 V, ~ 50 Hz
		13	brown		
pump	M3	3	blue	Pump's cable	220 V, ~ 50 Hz
		6	brown		
Gas supply regulator	M4	10	brown	Main cable	220 V, ~ 50 Hz
		11	blue		
Modulator coil of gas supply	M9	19	black	Gas supply	17V, 180 mA

regulator		20	black	regulator's cable	
igniter	M4	8	black	Main cable	220V, ~ 50 Hz Hz
		9	red		
Thermo relay 95 °C (water overheating sensor)	M6	17	blue	Air pressure switch cable	24V, 10 mA
		18	brown		
Air pressure switch	M6	15	blue	Air pressure switch cable	24 V, 10 mA
		16	blue		
Pressure sensor	M9	22	black	Gas supply regulator's cable	24 V, 10 mA
		23	red		
Water flow DHW	M9	24	blue	Gas supply regulator's cable	24 V, 10 mA
		25	brown		
Temperature sensor CH	M11	30	blue	CH temperature sensor cable	10 kOhm (at 25 °C)
		31	blue		
Temperature sensor DHW	M10	36	blue	DHW Temperature sensor cable	10 kOhm (at 25 °C)
		37	blue		
Ionization plug	M5	40	red	Ionization plug cable	
Ignition plug	—	—	red	Ignition plug sensor	12 kW
Room thermostat (option, see p.10.3.1)	M10	28			24 V, 10 mA
		29			
Remote control (option, see p.10.3.2)	M8	40			
		41			
Outdoor temperature sensor (option, see p.10.3.3)	M10	26			10 kOhm
		27			
PC for diagnostics (option, see p. 10.3.4)	M7				
Zone control board (option, see p.10.3.5)	M8	38			
		39			